

Farm Chemicals

Pioneer Journal
of the Industry

Meet
Program . . . 40

Elements
Glass 41

Tolerance
Guide 45

AGRICULTURE
SEP 14 1956

Harold Ostvold, Asst. Prof.
U. of Minn., Inst. of Agr.
St. Paul 1, Minn.

How's Your Fertilizer Condition?



Do you like it?

Do you have problems in preventing bag set with some of your fertilizer grades? You can get better condition at no extra cost with **ARCADIAN® URANA® Nitrogen Solutions**.

Many fertilizer producers are using URANA Nitrogen Solutions to help prevent this caking or lumping. URANA improves condition both for storage and distribution of mixed fertilizers. The ammonium chloride salts crystallize as cubes instead of in the shape of needles or ferns. These cubes do not bind or cake the granules together. You produce well-cured fertilizer that maintains

better condition. Furthermore, Urana Solution supplies another nitrogen source — urea or water soluble organic nitrogen.

You can now get URANA 15 (15% urea), URANA 12 (12% urea), URANA 10 (10% urea) and other URANA Solutions at the same price for nitrogen as ARCADIAN NITRANA® and U-A-S® Solutions. NITRANA and U-A-S Nitrogen Solutions and N-dure® Urea-Formaldehyde Solution also provide important conditioning advantages. For detailed information, call a Nitrogen Division technical service representative.



NITROGEN DIVISION Allied Chemical & Dye Corporation
New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio • Omaha 7, Neb.
Kalamazoo, Mich. • Columbia 1, S. C. • Atlanta 3, Ga. • Indianapolis 20, Ind.
Columbia, Mo. • St. Paul 4, Minn. • San Francisco 4, Cal. • Los Angeles 5, Cal.



Nitrogen Solutions: NITRANA® • URANA® • U-A-S® • N-DURE®

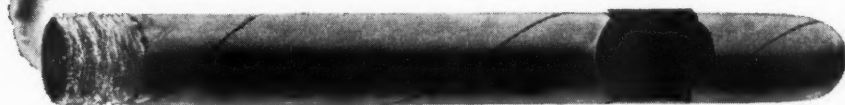
Other Nitrogen Products: Anhydrous Ammonia • Urea Products • A-N-L® • Sulphate of Ammonia

*Trade-mark

th
be

know
deve
cons
mult
for
our
our
If yo
wall
the
SEPT

Cigars and Multiwall Bags



Kraft Bag Corporation, as a manufacturer of multiwall bags, is in the same position as the cigar manufacturer who complained that everything to be said about his 25c cigars had already been said about 5-centers!



...but there is no doubt about the quality of the multiwall bags that bear the Kraft Bag Corporation stamp!



Our completely integrated plants and modern facilities producing every type of heavy-duty valve or open mouth bag, are second to none!

As an exponent of true specialization, there isn't a single known or desirable time-and-labor-saving development that we haven't already either considered, initiated, adopted or built into multiwall bags we are called upon to make for America's industries, while continuing our search for still better ways to package our customers' products.

If your product can be packaged in a multiwall bag — you can depend on us to make the bag to fit your product.

Investigate
The KRAFTPACKER®
Open Mouth Bag Filling
Machine for
free-flowing material
... highest accuracy
and production ...
reduces packaging costs
at an unbelievable rate.



KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Plants at St. Marys, Georgia and Gilman, Vermont

Farm Chemicals

SEPTEMBER, 1956

No. 9

Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

INDUSTRY NEWS

Business & Management	5	Associations & Meetings	22
People	19	Government	28
Calendar	26		

FEATURES

NAC Meet Program	40
FTE—Trace Elements in Glass	41
<i>By R. B. Schaall</i>	
FC Pesticide Tolerance Guide	45
Vitamin B-12 Made From Milorganite	64

DEPARTMENTS

Viewing Washington		Chemicals	58
On Agriculture	31	Pest Reports	59
On Business	32	Patent Reviews	62
Reader Service	33	<i>Dr. Melvin Nord</i>	
Markets	55	Statistics	63
Equipment & Supplies	56	Buyers' Guide	67
Suppliers' Briefs	57		

STAFF

Publisher	SAM LEWIS VEITCH	Wash. Bureau Chief	JOHN HARMS
Editor	GEO. P. TEEL, JR.	Business Manager	A. A. WARE
Editorial Assistant	PHYLLIS GERHART	Advertising Manager	WARD CRANE

ADVERTISING REPRESENTATIVES

Chicago 1. Al Zilenziger, 333 N. Michigan Avenue State 2-7128
Los Angeles 36. Hughlett Hollyday, Jr., 5478 Wilshire Blvd. Webster 8-1201
New York. Rod Zilenziger, 415 Lexington Ave. Murray Hill 7-1488
San Francisco 4. William Blair Smith, Russ Building Exbrook 2-3723



Member

Business Publications Audit

A magazine national in scope and circulation and devoted to manufacturers, mixers and formulators of plant foods and pesticides. It has a free controlled circulation within specified segments of the industry.

Subscription rates to all others are: U.S., its possessions, Canada, Cuba and Panama—\$6.00; Mexico and foreign: \$7.50. Single Copy—\$.50. Back Numbers \$1.00.

Published monthly by Ware Bros. Company, 317 N. Broad St., Philadelphia 7, Pa.
Telephone Market 7-3405

Acceptance under Section 34.64 P. L. & R., authorized

In this issue . . .

NAC Association is in the spot-light this month with its 23rd annual meeting scheduled for Spring Lake, N. J., on September 5-7. See page 40 for a program preview.

Exactly three years ago, FC published the first information on Ferro FTE—the fritted trace element material that combines plant foods in a glass mixture. The product has undergone constant refinement since its introduction and tests conducted during the past few seasons indicate its value in crop production—both agricultural and horticultural. Turn to page 41 for the latest information on this product as described by R. B. Schaall.

A special 10 page section in this issue covers pesticide tolerances issued to date by FDA. Tables, prepared by the FC staff, list tolerances according to crop grouping for your convenience in future references. It begins on page 45.

A short feature on page 64 describes a new use for Milorganite, the organic material produced by Milwaukee's Sewage Commission. Research has found it to be a potent source of vitamin B-12 and a plant for commercial extraction will soon be erected.

Cover story

In production of Ferro FTE trace element material, the basic mixture is heated and melted in a smelter. As the molten glass pours from the smelter it is met by a cooling spray of water that hardens and shatters the mixture to form frit.

FARM CHEMICALS

SALESMEN... to help boost YOUR profits!

LION Advertisements Sell LION Nitrogen, and Your Mixed Goods, Too!

Continuous Lion advertising appears in leading farm publications, month-after-month, to pre-sell the Lion brand to farmers—and to sell the value of your mixed fertilizers as well!

Current advertisements are appearing in Farm and Ranch-Southern Agriculturist, Progressive Farmer, The Farmer, Nebraska Farmer, Kansas Farmer, Prairie Farmer, Wallace's Farmer & Iowa Homestead, Wisconsin Agriculturist and Farmer, Missouri Ruralist and Missouri Farmer. All of these advertisements are in color.

Each Lion advertisement promotes the economic benefits of properly using fertilizers, including Lion Ammonium Nitrate, to help increase the farmer's profits. Each advertisement sells hard on the importance of soil tests in the intelligent use of all commercial fertilizers. Lion, a leader in nitrogen production, leads the way to good fertilization practices... to better profits for you!

LION'S QUALITY LINE OF NITROGEN FERTILIZER MATERIALS

- LION ANHYDROUS AMMONIA**—82.2% nitrogen. Quality guaranteed.
- LION AQUA AMMONIA**—Ammonia content above 30%—other grades to suit your requirements.
- LION AMMONIUM NITRATE FERTILIZER**—Improved spherical pellets. Guaranteed 33.5% nitrogen.
- LION NITROGEN FERTILIZER SOLUTIONS**—Various types to suit your particular manufacturing needs.
- LION SULPHATE OF AMMONIA**—White, uniform, free-flowing crystals. Guaranteed 21% nitrogen.

LION OIL

A DIVISION OF MONSANTO
CHEMICAL COMPANY



COMPANY

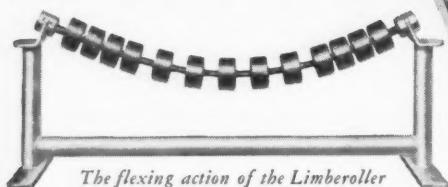
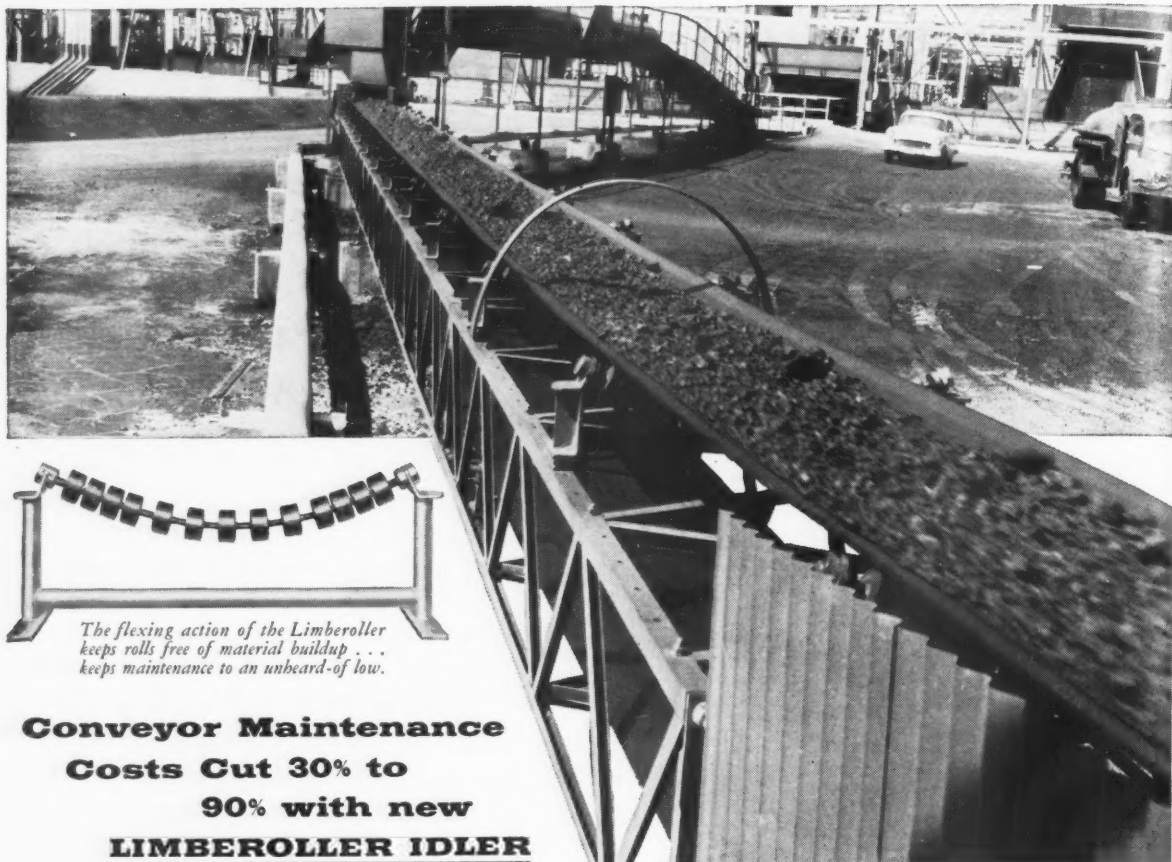
EL DORADO, ARKANSAS

DISTRICT SALES OFFICES: Lion Oil Building, El Dorado, Ark. • Insurance Exchange Building, Des Moines, Ia.
National Bank of Commerce Building, New Orleans, La. • 1401 Building, Atlanta, Ga.

At Last...

the **JOY LIMBEROLLER IDLER...**

a new type of belt conveyor idler that will handle sticky fertilizers without material buildup on rolls



The flexing action of the Limberoller keeps rolls free of material buildup... keeps maintenance to an unsaved-of low.

Conveyor Maintenance Costs Cut 30% to 90% with new LIMBEROLLER IDLER

The *Limberoller* is a new type of belt-conveyor idler that has been setting length-of-life records wherever used. It has already given over *twelve times* the service life of conventional idlers in many applications. It has proved extremely efficient in handling triple super-phosphate, ammonium sulphate and sticky fertilizers.

The Joy *Limberoller* resists dust, abrasion,

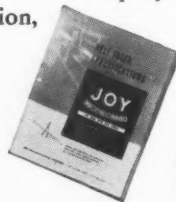
corrosion and material buildup. Resilient molded discs on a flexible steel cable conform to load and cushion the belt. Only two bearings are used and these are up out of the dirt zone. Get details from Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.



Write for **FREE Bulletin 113-77**

It gives complete information on the unique Limberoller Idler, and we'll be glad to supplement it with engineering assistance on your particular problem.

Consult a Joy Engineer



WSW 1 6201-113

JOY

SINCE 1851—OVER 100 YEARS OF
ENGINEERING LEADERSHIP

Business & Management

... News of the Industry

Texas Co. Constructs 180 T. Ammonia Plant

Foster Wheeler Corp. has been awarded the contract for construction of a synthetic ammonia plant at Lockport, Ill. for The Texas Co. Scheduled for completion in 1957, the 180 ton per day plant will utilize the Casale ammonia synthesis process.

Spencer Announces Sweepstakes Winner

Charles Geiger of Ottawa, Kansas has won first prize of the Spencer Chemical Corp. Fall Application Sweepstakes. Owner of the Farmer's Elevator at Ottawa, he and his wife are expected to leave for Mexico by air sometime in September on their eight day expense paid trip. Geiger won out of 900 entries in the 10 state area involved in the contest.

O-M Plant Has BHC Explosion

The recent explosion at the Olin Mathieson Chemical Corp. BHC plant at Niagara Falls, N. Y., caused over one million dollars damage and killed three workers during the noon hour blast. Fire broke out during the explosion but was brought under control shortly. Company officials stated that an investigation to determine the cause would be started.

Monsanto, Colo. F & I Plan Phos. Plant

Monsanto and Colorado Fuel & Iron have announced the construction of a new phosphoric plant to be located at Pueblo, Colo. The plant will be the first of its kind to produce phosphoric

acid. Monsanto plans to ship elemental phosphorous from its Soda Springs, Ida. plant to Pueblo, where it will be burned in a new unit specially designed for the operation.

The acid will be then pumped into the present Colorado Fuel and Iron system for the production of diammonium phosphate, and marketed by Colorado Fuel and Iron.

Prentiss Drug Moves

Prentiss Drug and Chemical Co. has moved its main offices to 101 West 31 Street, New York 1, N. Y. New phone number: PEnnsylvania 6-6766.

Calif. Spray Am. Sul. Unit Completed

California Spray Chemical Corp. awarded a contract for construction of an ammonium sulfate crystallizing unit to Ehrhart and Associates. Completion of the unit, part of a 150-ton-per-day addition, was accomplished last month.

Marketing of the plant's production will be carried out in the western parts of the United States. Other portions of the plant will manufacture liquid and pelleted fertilizer.

Ky. Dist. Enters Chem. Mfg. Field

Kentucky Distributors of Paris, Ky. has obtained a state charter for the manufacture and distribution of agricultural chemicals. J. Woodford Howard, Harris S. Howard and Mrs. T. R. Ranier are listed as the incorporators, all from Prestonburg, Ky.

Finland Uses French Fertilizer Process

The French chemical firm of Potasse et Engrais Chimiques will license Typpi O/Y Oulou Co. of Finland to manufacture 400 tons of fertilizer per day using its process for complex plant foods.

Other countries using the process are Germany, Sweden and Formosa.

Nitro-Form Div. To Expand Sales

Due to wide acceptance of urea-formaldehyde nitrogen compounds, Woonsocket Color and Chemical Co. has announced plans for a half to three-quarter million dollar expansion. Included in the plans is formation of Nitro-Form Division as a separate corporation. Plans call for the sale and promotion of insecticides, herbicides, fungicides and urea-formaldehyde fertilizers, by the newly formed corporation.

Stauffer, Montrose Build Plant in Mex.

Stauffer Chemical Co. and Montrose Chemical Co. have announced the formation of Montrose Mexicana, S. A.

Plans call for the construction of a mercury cell chlorine-caustic-soda plant in Mexico, along with DDT facilities. Capitalization of the project is estimated to be 4 million dollars.

U. S. Testing Opens Memphis Soils Lab.

An analytical soils laboratory has been opened in Memphis, Tenn. by the United States Testing Co. to run routine soil tests.

Object of the service is to allow farm management more selection in planned programming, based upon individual farm needs.

Now—for direct application . . .

**highest quality.
granulated triple super**



Just one trip across the field with this dustless, easy-to-handle, granulated 0-45-0 will make a repeat customer out of a trial user. Cash in now on fall sales.

Builds customer satisfaction and repeat sales

You'll like the compliments you'll get after your customers have tried your new 0-45-0 from International for the first time.

Look at typical comments from users of this high-quality triple:

"It sure goes on easy." (You bet it does! It's granulated for easy going through any fertilizing rig.)

"Pleasure to use." (Yes . . . and just one downwind trip across the

field will prove it to anyone . . . will build more repeat sales than a dozen sales talks.)

"Saves time and money." (Now your customers can avoid breaking up lumps in the bag or stopping in the middle of a field to kick a clogged-up rig. Easy to handle . . . just fill the fertilizer hopper and push off. Easy to put on.)

What's more, agronomists can

tell you the high availability of this superior product delivers results that build farmer satisfaction and repeat sales. The reason: special processing and manufacturing care produces a triple that resists reversion in the soil . . . supplies growing plants the phosphorus they need when they need it.

Call or write International today for samples and complete details.

y. free-flowing...top-performing
er that sells itself on sight

*bagged under your own label...
shipped direct to your dealers**

Here's a new triple super you'll be proud to add to your own line of fertilizers... the new, granulated 0-45-0 from International Minerals and Chemical.

This superior triple can be shipped in bulk, or International will be happy to have it bagged in adequate quantities under your own label... ship direct to your own dealers, too, if you like.

Here's what this can mean to you:

- A top-quality triple super that carries your own private label and complements the rest of your line.
- A modern, easy-to-use, top-performing triple super that will bring you increased

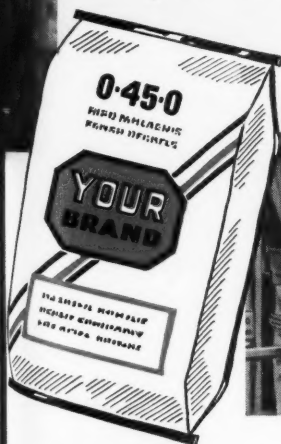
customer satisfaction and plenty of repeat sales.

- The unbeatable convenience of distributing this high-quality product under your own brand name direct to your dealers without touching a single bag.

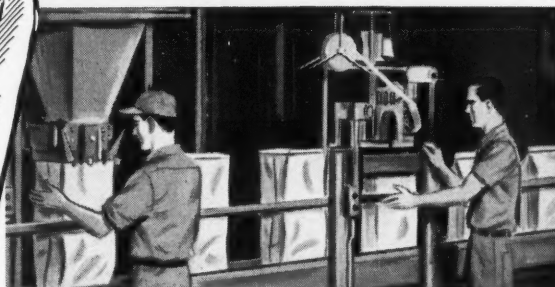
What's more, you'll find that dealing with International is a pleasure. You'll appreciate the friendly cooperation from International's transportation department... the fast service... and the reliability of supply.

See your International triple-super sales representative soon for complete details on minimum order requirements, price and delivery information. He'll be glad to show you samples. And one look at this new 0-45-0 will show you why you can't get a better deal than this new triple super now available for direct application sales.

**subject to minimum
order requirements*



Profit now from this superior 0-45-0. Bagged under your own brand name.



Superior texture of this new triple super, put up in your own bags, stores without caking. It's granulated for easy going through any fertilizer attachment.



PHOSPHATE CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6



**offers low-cost nitrogen
for every need**

Commercial Solvents Corporation is currently producing and supplying fertilizer manufacturers with the important forms of nitrogen. The liquid forms are widely used for the preparation of high-analysis fertilizers and for the ammoniation of superphosphates. The *new granule Hi-D* (High Density) CSC Ammonium Nitrate Fertilizer, an exclusive free-flowing, low moisture form of ammonium nitrate, is distributed entirely through fertilizer manufacturers.

**Prompt service from
these District Offices:**

ATLANTA 8, GA:
344 Williams St., N. W., Jackson 5-6996

ST. LOUIS 17, MO:
7890 Folk Ave., Mission 5-3330

STERLINGTON, LA:
Sterlington 3451

AGRICULTURAL CHEMICALS DEPARTMENT • COMMERCIAL SOLVENTS CORPORATION
260 Madison Avenue, New York 16, N. Y.

NITROGEN the  of the Harvest

TRIPLE SUPER- PHOSPHATE



"Maximum" means more in ammoniation when you choose U.S. Phosphoric Products as your source for Triple Superphosphate. It means more, too, in terms of service—the kind of prompt, dependable deliveries on which you can base your production—as it has meant for 30 years.

Call in your Bradley & Baker representative to help you plan your shipments of superior quality U.S. Phosphoric Products Triple Superphosphate in whatever grade you require.

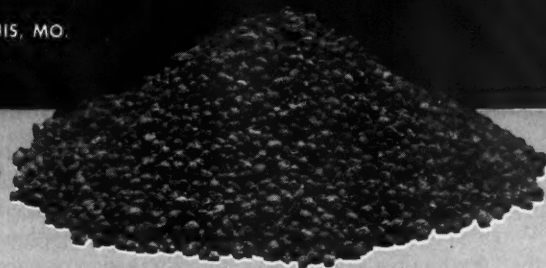
U.S. PHOSPHORIC
Division
TENNESSEE PRODUCTS
CORPORATION Tampa, Florida

Sales agents: **BRADLEY & BAKER** • 155 EAST 44th STREET • NEW YORK 17, N. Y.

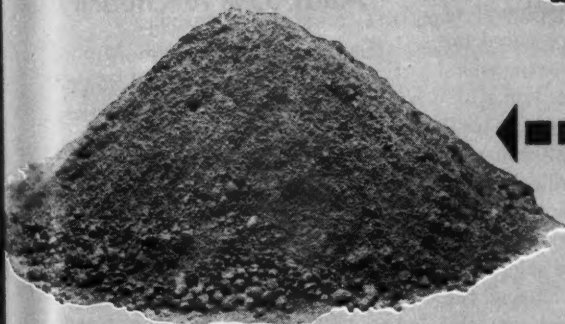
District Sales Offices:

ATLANTA, GA. • INDIANAPOLIS, IND. • ST. LOUIS, MO.
NORFOLK, VA. • HOUSTON, TEX.

■■■■GRANULAR■■■▶



◀■■■■■■■■RUN-OF-PILE■■■■■■■■



■■■■■■■■■■COARSE■■■■▶



. . . Business & Management

Strip Mining of Phos. Carried out in Mont.

J. R. Simplot has begun strip mining of phosphate ore at a location near Lakeview, Mont. The mine site is at the Idaho-Montana border, and a railroad spur is being installed to facilitate the hauling operation.

Crushing and loading operations will be centered at Lakeview, where shipment of the processed material will be carried out.

Crest Chemicals Builds Fert. Plant

Marlowe Sharf, president of Crest Chemicals, Watertown, S. D., announced that McNulty Construction Co. has been awarded a general contract of 200,000 dollars for construction of its fertilizer plant. The building is to be located at the Great Northern Industrial Site, west of Watertown, on highway 212.

Plant capacity is estimated at 20 tons per hour of granular inorganic fertilizer.

This is the second plant of this size in the state.

Valley Hill Chem. Installs Equipment

Installation of plant equipment at the Valley Hill Chemical Corp., Jackson, Tenn., fertilizer plant has begun. When completed it is estimated that production will be 125 tons per day.

Brea Chem. Wins 5th Safety Award

The fifth safety award was given to Brea Chemicals, Inc. for completing over a million man hours of work without injury. The award covered a period of 932 days, and a total of 1,166,378 man hours, dating back to the start of company activities.



Shown making the Award is Mr. J. T. Blalock, Pres. of the Los Angeles National Safety Council, to Pres. Homer Reed of Brea Chemicals Inc.

Allied Nit. Div. has New House Organ

Allied Chemical's Nitrogen Div. has announced the publication of a new bulletin called "Arcadian Spreader". It is designed to foster exchange of ideas between sales personnel of the division. Material which is of interest and helpful to its personnel in promoting its products will be used in the publication.

FMC Issues 30 Milln. New 3.8% Debentures

Food Machinery & Chemical Corp. has issued 30 million dollars worth of 3.8 per cent debentures for expansion and repayment of old debt. Proceeds are slated for modernization and expansion, planned in 1956.

During 1955, 48 per cent of total sales were derived from industrial and agricultural chemical sales, while 35 per cent came from food processing and industrial machinery. The remainder of sales were government orders. During the last five years total sales of the company have increased 74 per cent while net income increased 53 per cent in the same period.

Shell Expands Labs

Shell Chemical has let the construction contract for its new customer service labs to Walter Kidde Constructors, Inc. Designed to test new uses of Shell products it will have 26,000 square feet of floor space. Construction is to be started immediately, with completion anticipated by April 1957.

Major emphasis will be on the development of epon resins; however, development of agricultural chemical formulations will also be included.

Cal Spray Trade- Mark Changed

In addition to the familiar ORTHO trademark, California Spray Chemical Corp. has begun using the red, white and blue Chevron trademark of its parent company, Standard Oil Company of Calif. Some 750 products are involved in the change.

The addition of Standard's emblem is part of an over-all program to extend the familiar trademark to all products and services offered by Standard and its subsidiaries.

Garfield Chemical Adds 35% to Capacity

Garfield Chemical and Manufacturing Corp. has added 35 per cent to its sulfuric acid facilities, increasing total production capacity to 1,100 tons a day. This is the fifth contact process added to the plant, located at Garfield, Utah, which is jointly owned by American Smelting and Refining Co., and Kennecott Copper Corp. Plant production is expected to go entirely to the intermountain region.

DON'T SIGN THAT ORDER!



SAVE MONEY ON 1956 NITROGEN CONTRACTS

Freight represents a high percentage of your costs for nitrogen solutions, anhydrous ammonia and aqua ammonia. The completion of Sinclair's strategically located new plant in Hammond, Indiana, means a sharp reduction in freight costs for many nitrogen users located in the Mid-West.

Here's another big advantage! Sinclair's new facilities and vast new storage capacity make it possible to meet *your* production schedule — even during peak season. Two tank car fleets are held in readiness — one for exclusive use in shipping anhydrous ammonia, the other for nitrogen solutions.

So don't sign that contract... first find out how this new Sinclair plant in the heart of the Mid-West can cut your costs and delivery time of nitrogen supplies. Write or telephone...

SINCLAIR CHEMICALS, INC.

(Affiliate of Sinclair Refining Company)

600 Fifth Avenue, New York 20, N. Y. — Phone Circle 6-3600
155 North Wacker Drive, Chicago 6, Illinois — Phone Financial 6-5900



Meet The Demand For High Analysis

Use

DAVISON'S TRIPLE Superphosphate

State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's New Triple Superphosphate in your formulation.

Davison's Triple Superphosphate has 45/46% available P_2O_5 and is supplied in the easy-to-use granulated form or run-of-pile.

Order Davison's Triple Superphosphate. For complete information, call or write.

Progress **D** Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.
Baltimore 3, Maryland



PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLOURIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.

. . . Business & Management

Philippines Build Sulfuric Acid Plant

Arrangements have been completed between Atlas Consolidated Mining Co. of Cebu, Philippines and the Central Bank of the Philippines for the construction of a sulfuric acid plant. Site will be near the mining operations of its Toledo copper mine. Capacity of the operation will be 120 metric tons of sulfuric acid plus 25 tons of phosphoric acid.

A fertilizer mixing, bagging and granulating unit of 432 tons per day is also planned. Production is slated to start in late 1957. It is estimated that a savings to the Philippines will amount to six and half million dollars per year from the plant's construction, since that amount is presently allocated for purchase of fertilizers abroad.

Armour Observer Plan Started in Europe

July was the beginning of the Armour Research Foundation's European Observer Plan. Recently organized, with eighteen member companies participating, the group will have access to any new technical developments in Europe which could find use in the United States. Some of the member companies include International Minerals and Chemical, Quaker Oats and Parke Davis.

J & L Starts Using Hydrofining Process

Jones and Laughlin Steel Corp. has announced plans for the construction of a two million dollar refining process which will aid in the production of higher quality coal chemicals. Esso Research and Engineering Co. has licensed Jones and Laughlin to use its hydrofining sulfur removal process. With this treatment, harmful sulfur compounds will be removed from various chemicals being produced by the coking process.

Products such as benzene, toluene and xylene will be enhanced by the treatment, in that benzene, for example, will contain less than 1 part per million of sulfur.

The hydrofining unit will have a capacity of 55,000 gallons per day. Recently consumption of these chemicals has increased sharply, to 300 million gallons per year, while in 1938 they were being used at the rate of 30 million gallons. Coal coke supplies about two-thirds of the total amount, while the petroleum industry supplies the balance.

Harris Laboratories to Plan Soils Expansion

Harris Laboratories has purchased Alfalfa Processors Laboratory of Omaha, Neb. The acquisition will provide more equipment for the Harris offices at Lincoln, Neb., permitting expansion into soil testing and farm management services.

Research work in the utilization of agricultural by-products will also be carried out at the Lincoln address.

Iowa Farmers Survey

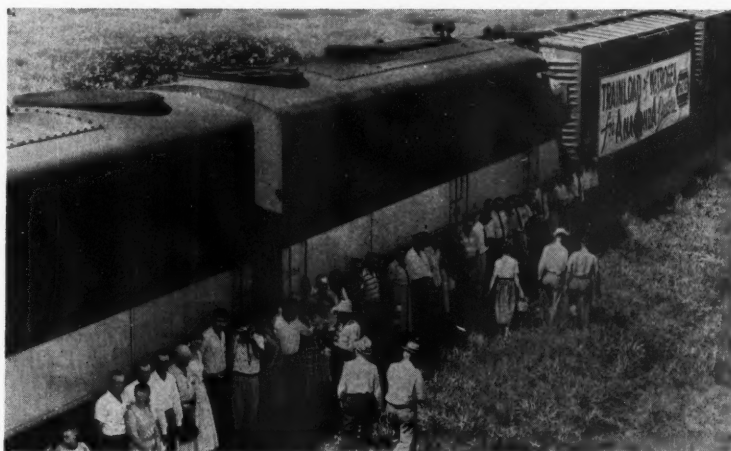
A recent Iowa survey shows that although farmers realize that larger farms are more efficient to operate, they are unwilling to risk expenditures to achieve the required size. Reasons given in the survey show that they are afraid of uncertainties in prices and production.

Operators stated they are wary of losing what they presently have in order to own a larger, more efficient farm. They believe that the best-sized unit is one which provides an acceptable degree of income certainty and satisfies personal preferences.

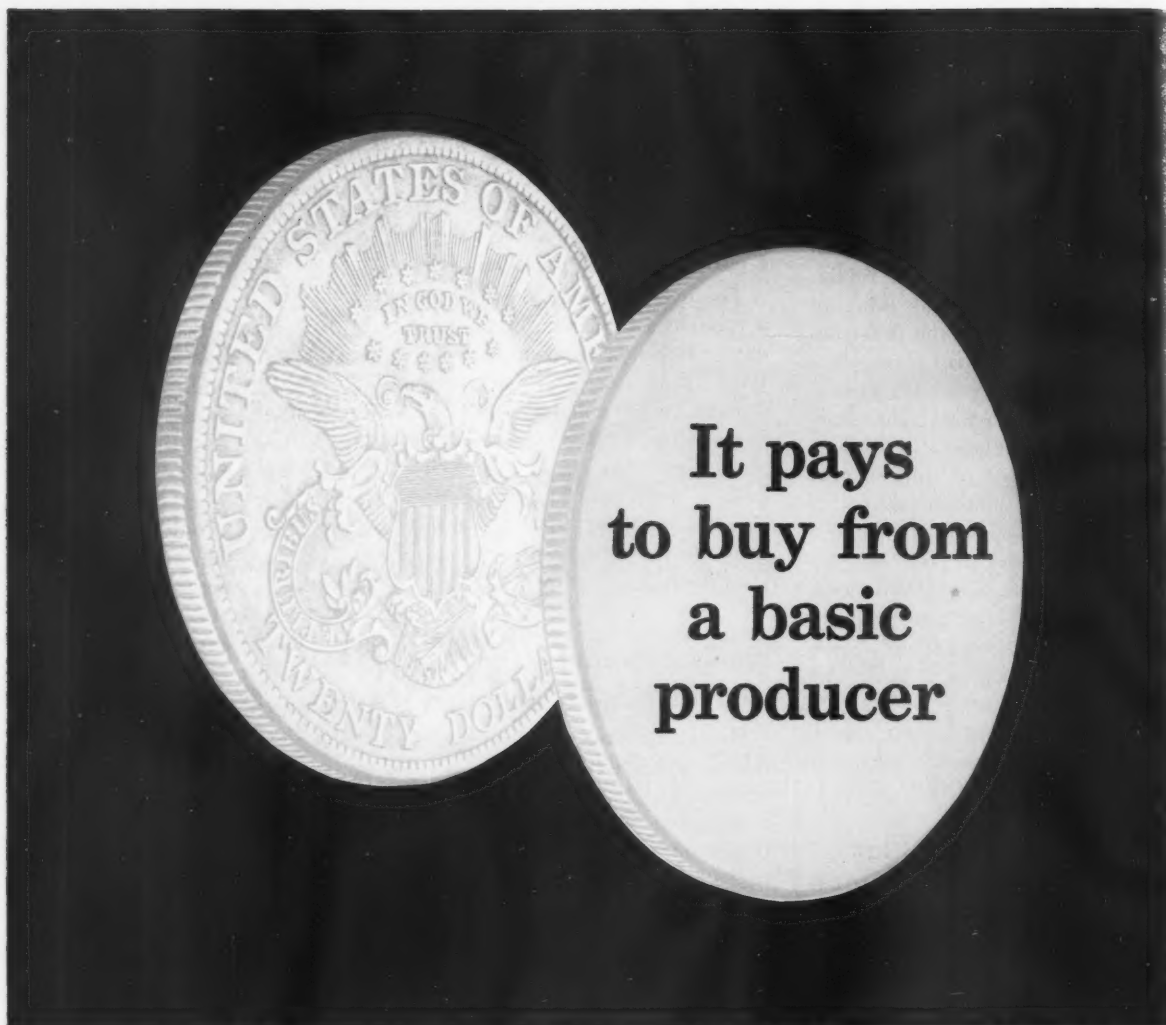
Richlawn Fertilizer Plans Expansion

G. D. Egger, president of Richlawn Fertilizer Co., Fort Worth, Tex., has announced plans for distributorships in other cities. Distribution is now established in Arlington, Tex. and Little Rock, Ark. Richlawn Fertilizer is manufactured and sold in Fort Worth, Tex., and marketed to other outlets. In addition to providing plant nutrients it contains dieldrin.

Giant Spencer Nitrate Shipment



Here's part of an 83-car trainload of Spencer ammonium nitrate, thought to be the largest single fertilizer shipment ever made in Kansas. It was delivered to Anaconda Fertilizer Co. dealers, who recently were guests of Spencer Chemical Co. at its Jayhawk yards near Pittsburg, Kansas.



The double eagle twenty dollar gold piece illustrated was first coined in 1849.

AMONG formulators and distributors, PENNSALT chemicals are known for their dependable potency, high performance and constant quality. Our customers know that buying from PENNSALT, a basic producer, means speedy delivery of PENCO_® brand agricultural chemicals from close-by plants or stocks and ability to satisfy. Our technical service is available to you. You'll do well when you depend on PENNSALT.

PENNSYLVANIA SALT MANUFACTURING COMPANY OF WASHINGTON

AURORA, ILLINOIS

TACOMA, WASHINGTON

BRYAN, TEXAS

Berkeley, California

Los Angeles, California

Montgomery, Alabama

Philadelphia, Pennsylvania

Portland, Oregon

Producing Chemicals for farm, home and industry for over 105 years



**IN
PEACHES,
POTASH-ENRICHED
FERTILIZERS
MAKE
THE
DIFFERENCE**



with sufficient potash



without sufficient potash

It makes quite a difference in size and yield—and in the farmer's profit, too—when the basic nutritive elements in a soil are replenished with balanced fertilizers. Potash, a necessary ingredient of these balanced fertilizers, builds up the resistance of crops to diseases, while increasing both quality and yield.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

**UNITED STATES
POTASH COMPANY**

**DIVISION OF UNITED STATES BORAX
& CHEMICAL CORPORATION**

30 Rockefeller Plaza, New York 20, N. Y.

Southern Sales Office

Rhodes-Haverty Building, Atlanta, Georgia



REG. U. S. PAT. OFF.

**HIGRADE MURIATE OF
POTASH 62/63% K_2O
GRANULAR MURIATE OF
POTASH 60% K_2O MIN.**

... Business & Management

Oil Enhances Fert. Condition Wis. Claims

Based on tests at the University of Wisconsin, researchers find that the addition of a little oil to fertilizers will improve its condition. Less likelihood of corrosion, and caking in storage will result by its addition.

Work also indicates that the addition will not harm plant growth, nor will it reduce yields. Any oil build up in the soil is unlikely, because of microorganisms breaking down the soil and therefore preventing any accumulations. Crops used in the tests were oats, tobacco and corn planted both in field trials and under greenhouse conditions.

Liquid Fert. Plant At Monroe, Iowa

Production of liquid fertilizers has started at the Monroe, Iowa, plant of the Ouachita Fertilizer and Chemical Co. The plant site is on Sterling Road.

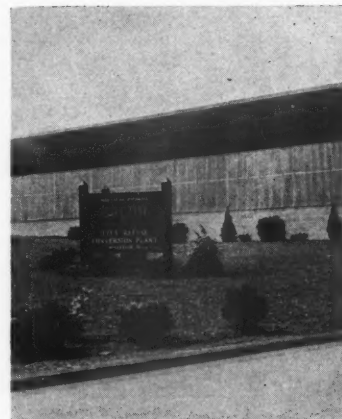
Pending Congressional Farm Chem Legislation

During the last few weeks of the past congressional session many bills affecting the chemical industry were passed over, in order to allow congress to adjourn. Some, however, will be reintroduced in January at the 85th meeting of congress.

Of major concern to the pesticide industry will be the effect pending bills will have which require the Interior Dept. to investigate the effects of insecticides,

herbicides and fungicides on fish and wildlife.

Garbage to Fert. Plant Constructed



Above the McKeesport, Penn. plant of the Organic Corporation of America, capable of converting raw garbage into organic fertilizers.

FOR A *Superior* AGRICULTURAL LIMESTONE PRODUCT



BRADLEY HERCULES MILLS



From rough to finish . . .
in one low-cost operation

Constant progress in design and manufacture over the past 50 years has made Bradley Hercules Mills the standard pulverizer where a superior agricultural limestone product is desired. Automatic electrical feed control eliminates manual operation. Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum. In sizes to meet the requirements of most any plant at moderate cost.

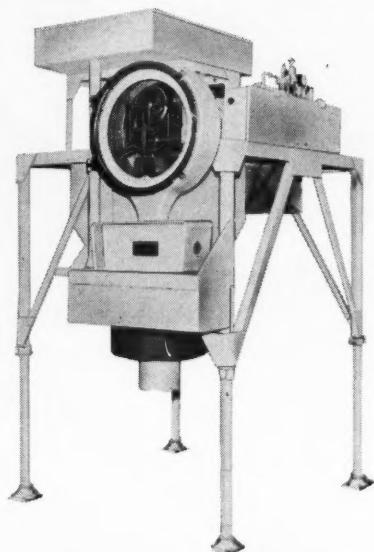
For complete information, write for Catalog No. 61.



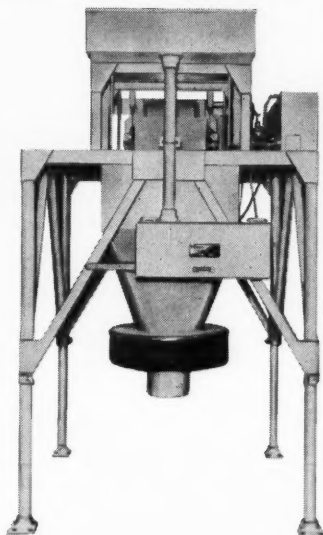
Bradley PULVERIZER CO.

LONDON ALLENTOWN, PENNA. BOSTON

When your trade demands 50's keep your packaging costs down with the **UNION I & C BAGGER**



MODEL UB 101 (Dial Scale)
for finer weight tolerances and
visible weight check



MODEL UB 100-A (Double Beam Scale)
for accurate, high speed weigh-
ing of granular materials

If you are faced with the neces-
sity of packaging in 50-lb. units,
the Union I & C Bagger can
help you eliminate the increased
packaging expenses you would
otherwise face.

The Union Bagger easily han-
dles up to twenty 50-lb. bags a
minute. You can convert from
100-lb. containers and still
maintain your net tonnage per
hour.

Over 300 Union Baggers have
been installed by fertilizer
manufacturers in the past two
years alone. The savings you
make with this automatic and
practically fool-proof high
speed equipment not only im-
prove your competitive posi-
tion, but your savings alone
actually pay the full cost of the
Bagger in a remarkably short
period of time.

We will be glad to demonstrate
with actual figures based on
recent fertilizer installations.

Ends "rush season" production worries, brings about greatest savings, fertilizer executives report



SOLVES RUSH SEASON SHIPPING PROBLEMS

"Your UB-101 machine has
proved to be more than ade-
quate in every phase of per-
formance."

P. L. Etheredge, Secretary-Treasurer
Etheredge Guano Company, Inc.,
Augusta, Ga.



ELIMINATES ALL OVERTIME

"We were able to eliminate all over-
time during the past two seasons,
which I am convinced more than
compensated us for the small cost
of the baggers."

"The speed and accuracy of these
C. P. Belding, Supt., F. S. Royster
Guano Company, Athens, Ga.

units made the many thousands of
tons we handled during the rush
period a pleasure.

"One of the most significant fea-
tures is the lack of maintenance. The
amount we have expended would
not exceed \$25 for the past two
years."



PRODUCTION UP 50%—LABOR SAVINGS 33%

"The Union I & C Bagger has enabled us to increase
production to 50 to 60 tons per hour, compared with
35 to 40 tons in the past, and we are able to do it
with two men instead of three. The Union Bagger
is as fast and efficient a bagger as I've ever en-
countered. Its performance has been little short of
sensational."

C. L. Durham, Plant Superintendent
Dixie Guano Co., Laurinburg, N. C.



**NEW! SEND FOR UNION'S AUTHORITATIVE AND
PRACTICAL "FERTILIZER PACKAGING WORK KIT"**

**Package Engineering Department
Union Bag-Camp Paper Corporation
233 Broadway, New York 7, N. Y.**

Please send immediately your new "Fertilizer Packaging
Work Kit" which includes a new calculator for figuring
our bagging cost-per-ton. I understand there is no
charge or obligation.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

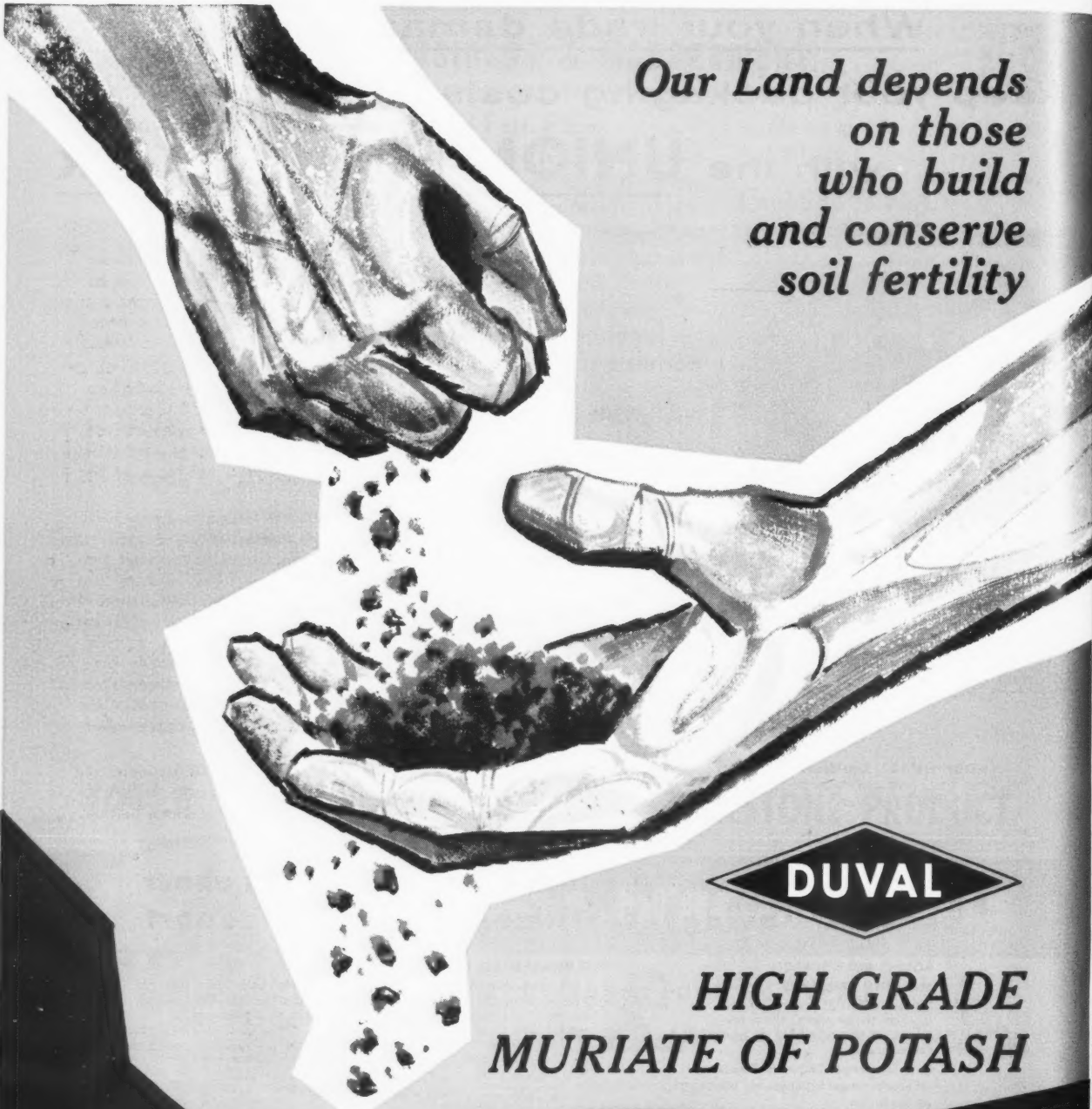
UNION I & C BAGGER



Automatic Weighing and Filling Machine for Open Mouth Bags

Manufactured by INGLETT & CORLEY, INC., AUGUSTA, GA.
Exclusive Sales Agents:

**PACKAGE ENGINEERING DEPARTMENT
UNION BAG - CAMP PAPER Corporation
233 Broadway, New York 7, N. Y.**



*Our Land depends
on those
who build
and conserve
soil fertility*

DUVAL

**HIGH GRADE
MURIATE OF POTASH**

will help do the job!

High Analysis . Unsurpassed Service

**DUVAL SULPHUR
and
POTASH CO.**

Modern Plant and Refinery at Carlsbad, New Mex.

Address all communications to
ASHCRAFT-WILKINSON CO.

Exclusive Distributors

ATLANTA, GEORGIA

Cable Address: Ashcraft

Norfolk, Va. Charleston, S. C. Tampa, Fla. Jackson, Miss. Columbus, Ohio Montgomery, Ala.

PEOPLE

Associated Seed Growers, Inc. William A. Liddell succeeds Francis Coulter as director of advertising and publicity.

Commercial Solvents Corp. R. T. Thompson has joined the agricultural chemicals marketing and distribution organization, handling sales in Georgia and Alabama. He will headquarter at the Atlanta office.



Thompson

William W. Wilson has been named manager of terminals for the Petrochemicals Div.

New supervisor of petrochemicals market research is Richard T. Ozimek.

Davison Chemical Co. New operating divisions and management personnel:

AGRICULTURAL CHEMICALS—David N. Hauseman, vice president and general manager; J. M. Harris, asst. general manager; William Caspari, Jr., sales manager.



Hauseman

CHEMICALS—F. C. Nicholson, vice president and general manager.



Watmough

MIXED FERTILIZER—W. N. Watmough, vice president and general manager; A. C. McCall, executive officer. Change in the branch plant organization

eliminates district manager offices. Branch plant managers now report directly to Baltimore.

Escambia Bay Chemical Corp. Dr. Leslie G. Boatright has been named to the Commercial Development Dept. He had been manager of market development with Jefferson Chemical Co.

Food Machinery & Chemical Corp. Chemical Divs. Four research chemists—Dr. Gino R. Treves, John A. Gannon, Murray H. Reich and Charles deThan—have been appointed to the staff of the FMC Chemicals Central Research Laboratory, being completed at Princeton, N. J.

International Min. & Chem. Corp. F. T. Nielsson joins the Plant Food Div. production staff as development section supervisor. Previously, he was technical director for F. S. Royster Guano Co. and project leader on fertilizer development for TVA.

Lion Oil Co. Norman Henry Eason, 56, assistant manager of chemical sales, died suddenly Aug. 8 in St. Louis.

Mississippi River Chemical Co. New technical service representative William W. Johnson will assist Bradley & Baker, distributors of MRCC agricultural products.

Monsanto Chemical Co. Dr. Lee E. Loveless becomes a group leader in the research dept. He will conduct work in a group studying plant and animal nutrition, located at Dayton.

Nitrogen Div., Allied Chem. & Dye Corp. Promotion of Dan K. Corell to field representative in charge of sales of fertilizer manufacturing materials in North Carolina is announced.

C. E. Porter is new superintendent of materials handling at South Point, O.

Olin Mathieson Chemical Corp. William F. Watkins has been named assistant manager of government services for the Plant Food, Insecticides and Industrial Chemicals Divs. He joined OM in 1953 as an agronomist.

Potash Co. of America. John W. Hall has been appointed vice president in charge of sales, and a director and member of the executive committee, succeeding the late George E. Pettitt. Hall began his business career in Swift & Co.'s Sales Dept., and joined PCA in 1950.



Hall

O. M. Scott & Sons Co. Appointment of Jack Welsch as director of sales has been announced.

Shea Chemical Corp. has appointed Dr. William F. Waldeck technical director.

Sinclair Chemicals, Inc.



Smith

Ray C. Smith, former manager of market development, has been named manager of domestic sales. He will manage the company's chemical marketing activities with headquarters in New York.

Succeeding Smith as manager of market development is Robert C. Sweeney. Prior to joining Sinclair Chemicals in 1952, he was with Hercules Powder Co.



Sweeney



YOU INCREASE PROFITS WHEN YOU USE

TRIANGLE BRAND COPPER SULPHATE

IN YOUR FUNGICIDE AND FERTILIZER FORMULATIONS

Since 1885, successful growers have preferred Triangle Brand Copper Sulphate in fungicides. It has consistently proved itself more effective and superior to organic materials; in sprays, where Bordeaux Mixture is the most reliable, or in dusts, if preferred.

In mixtures and emulsions, it is compatible with virtually every other pesticidal material. In fertilizers, it is important for enrichment of the soil and its use guarantees larger, healthier and more profitable crops. Forms of Triangle Brand Copper Sulphate available are:

INSTANT (powder) for quick and efficient mixing of Bordeaux sprays.

DIAMOND (snow) small or large crystals, all containing 25.2% metallic copper.

BASIC Copper Sulphate in powder form, containing 53% metallic copper.

Contact us today for further information on TRIANGLE BRAND COPPER SULPHATE and its use in your agricultural formulations.

PHELPS-DODGE

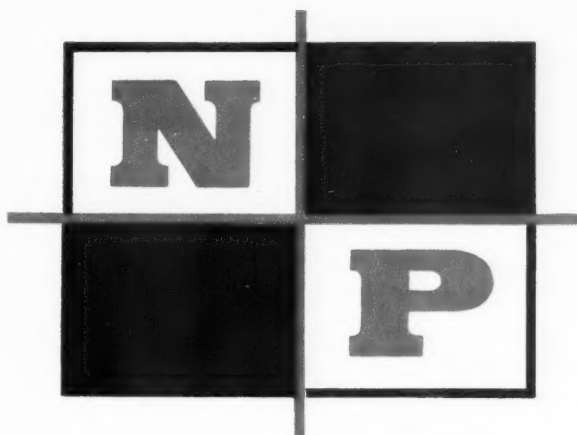
REFINING CORPORATION

300 PARK AVE., NEW YORK 22, N.Y.

5310 W. 66th STREET, CHICAGO 38, ILL.



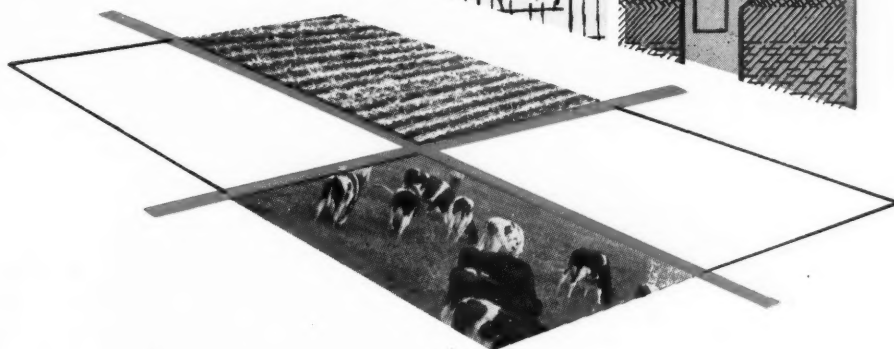
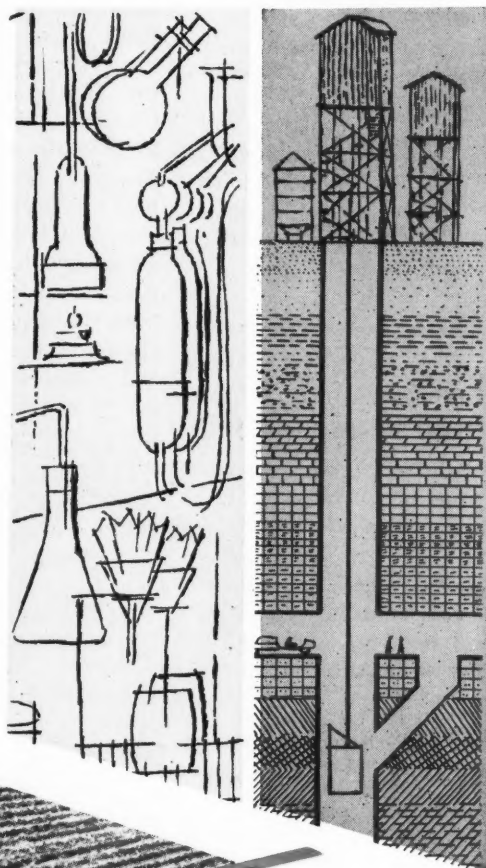
LOOK TO NATIONAL POTASH FOR QUALITY AND SERVICE



Backed by the skills and experience of its parent companies – Pittsburgh Consolidation Coal Company and Freeport Sulphur Company – NATIONAL POTASH offers important advantages as a dependable source of quality potash.

NATIONAL's mining operations and refining processes will include the very latest industry techniques, and its storage and shipping facilities have been planned to meet efficiently the demand of the peak fertilizer season.

In addition, NATIONAL POTASH provides a free, comprehensive Technical Service to help manufacturers with granulation, formulation and other production problems. Write for complete information.



**NATIONAL
POTASH COMPANY**

205 EAST 42nd ST. • NEW YORK 17, N. Y.

People . . .

Spencer Chem. Co. Harold C. Ihde is promoted to assistant sales manager, agr. chemicals.

Dr. Kenneth P. Dubrovin has been named a staff member in the Chemical Research Dept.

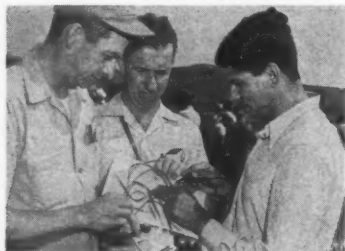
Stauffer Chem. Co. New Chauncey, N. Y. lab technical personnel: J. R. Gould, Harry Babad, G. G. Eberhardt, J. R. Capecci, Jr. and Robt. Clyne.

Virginia-Carolina Chemical Corp. appointments: J. Langhorne Tompkins, manager, and Stuart Nunnally, assistant manager, Traffic Dept.; C. Meredith Evans, Jr., manager, Cincinnati sales; W. F. Biggers, Greenville, S. C. superintendent.

Ga. Fert. Meetings Draw More than 300

More than 300 persons registered at one or more of the Extension Fertilizer Dealer-Manufacturer Fertilizer Conferences recently held at the Griffin, Athens and Tifton experiment stations, the Georgia Plant Food Educational Society reports.

Second 'Weed Day' At N. Y. Ag. College



F. H. Catlin, a custom spray operator; Ray R. Kriner, Central Chem. Co.; and Jal Parakh, a Cornell Graduate student, check a quack grass plant, during New York State College of Agriculture's Second Annual Weed Day, to determine the effect chemical treatment has had on it.

Associations & Meetings

Fert. Control Men To Meet on Oct. 19

On October 19, the Association of American Fertilizer Control Officials will meet in the Shoreham Hotel, Washington, D. C.

On the program are talks by Dr. M. P. Etheredge, president of the group; Dr. Russell Coleman, exec. vice president, National Plant Food Institute; W. F. Price, Plant Food Div., Swift & Co.; Dr. R. F. Poole, president, Clemson A & M College; Dr. Paul Sanders, editor, SOUTHERN PLANTER; Dr. F. W. Quackenbush, Indiana state chemist and Gen. John Hull, president, Manufacturing Chemists Association. Also to be given are results of a survey on changing from oxide to elemental basis for phosphorus and potassium, by George Enfield, USDA extension agronomist, and investigators and committee reports.

NPFI Cooperates in NE Fert. Conf.

The annual New England Fertilizer Conference, conducted in cooperation with the National Plant Food Institute, will be held at the Bald Peak Colony Club, Melvin Village, New Hampshire, on Sept. 12. A panel discussion, "The Future of New England Agriculture" is scheduled, as well as talks on the economics of pasture improvement and effects of fertilizer usage on production of farm products.

Firm Appointed to Handle NNSA Affairs

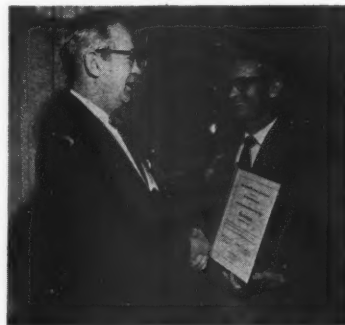
The National Nitrogen Solutions Association board of directors has named Storms and Westcott, an association management firm, to manage the affairs of the group, under the direction of officers and board. Executive

secretary is Muriel F. Collie, staff counsel and executive assistant with the management firm.

The group's plans for the future include a monthly news letter to members; regular news releases to the trade press; and an intensive membership drive.

A full report of progress is to be presented at the NNSA meeting in Sioux City, Iowa, Oct. 15-17.

Award to Kirkland



Louis Wilson, National Plant Food Institute secretary, presents Max D. Kirkland, N. J. Ext. Service Farm Radio-TV Editor and winner of the American Assn. of Agricultural College Editors-NPFI Agricultural Communications Award, with a scroll signed by national judges.

CSMA, MCA Issue New Publications

A 230-page booklet containing proceedings of the Chemical Specialties Mfrs.' Assns. 42nd annual meeting is available \$7.50 each—U. S. and Canada; \$8 elsewhere) from the group, 50 East 41st St., New York City 17.

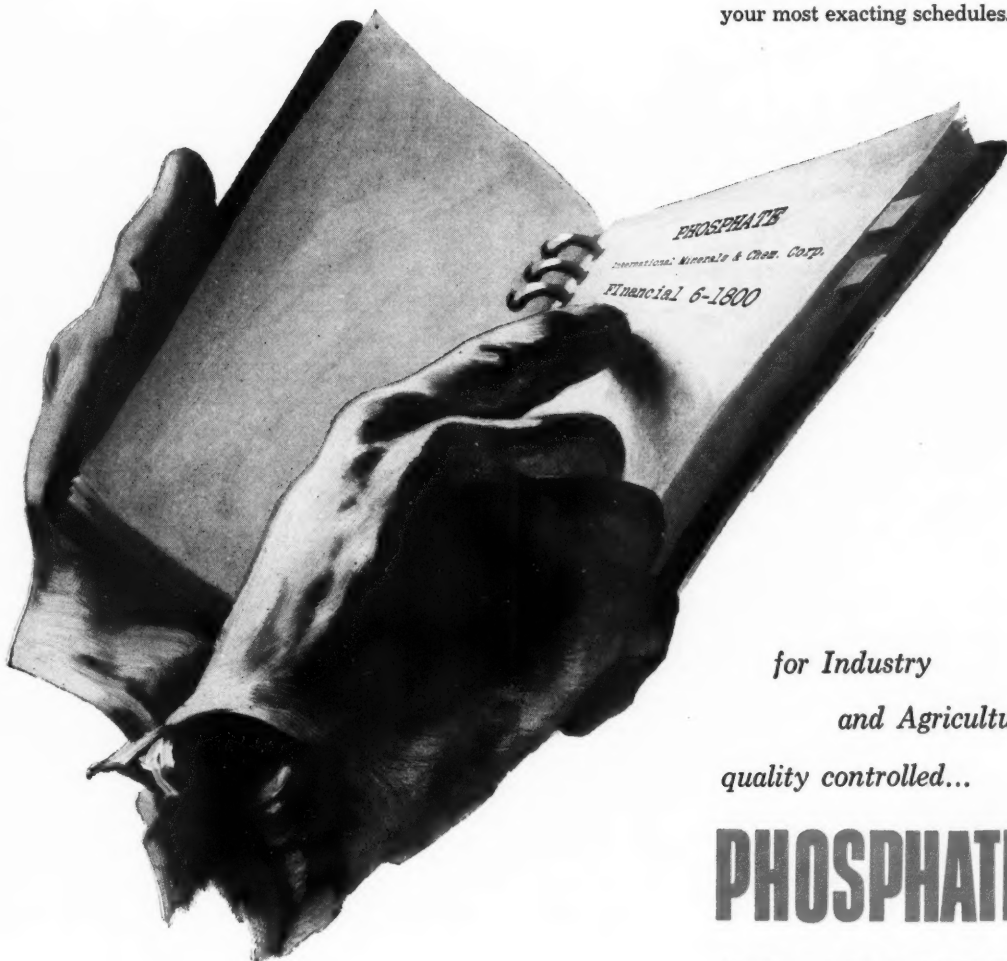
The Manufacturing Chemists' Association has just published the fourth revision of "Warning Labels," Manual L-1. Copies are \$1 each from MCA, 1625 Eye St., N. W., Washington 6, D. C.

Geigy Chemical Corp. and Missouri Coke and Chemical Div., Great Lakes Carbon Corp., have joined MCA.

WHEN YOU'VE GOT TO GET IT FAST

DIAL INTERNATIONAL

Need more phosphate in a hurry?
Call *International*. You'll get it
fast! That's one reason so many
plants depend on *International*—for
here are the resources and
facilities to give you extra-special
service as a matter of simple
routine. This service is yours to
command, yours to depend on
because of *International's* huge
production and enormous storage
capacity at mines and plants in
Florida and Tennessee. You have
available a full range of grades
of quality-controlled phosphates
and a traffic service that will meet
your most exacting schedules.



*for Industry
and Agriculture
quality controlled...*

PHOSPHATES

- ★ for the manufacture of complete fertilizers
- ★ for the manufacture of industrial chemicals
- ★ ground rock phosphate for direct application to the soil



PHOSPHATE MINERALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6 • Phosphate Mines and Plants in Florida at Narayn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales

SEPTEMBER, 1956

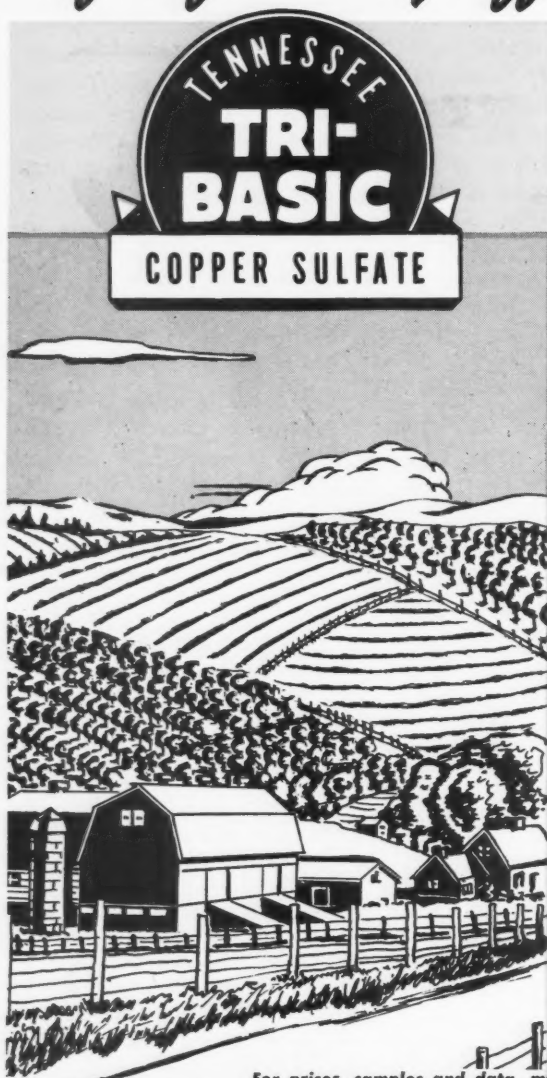
DUST MIXERS—FORMULATORS—CUSTOM SPRAYERS—GROWERS



TENNESSEE CORPORATION

From mining through research and chemical processing to profitable farming.

Why do disease control schedules call for finishing off with Copper?



Because research, and the experience of successful growers shows that copper fungicides are the best disease protection and insurance available with which to send their crops to market or storage.

Check These Money Making FACTS:

- ✓ Increased yields of number one quality. The type increase that produces greater profits.
- ✓ Improved storage and keeping qualities. It is the yield of number one's out of storage that pays dividends.
- ✓ Improved eating and flavor properties. Don't jeopardize your future and most important—the consumer—through the sale of "flat," watery produce.
- ✓ Economical to use. Compare the overall cost of TRI-BASIC against the organics.
- ✓ Easy to apply. Spray or dust. Compatible with other pesticides.
- ✓ No residue tolerance restrictions. Use as recommended. Insure against seizure or condemnation.

**FOR THE BEST IN COPPER
GET TENNESSEE TRI-BASIC
COPPER SULPHATE**

For prices, samples and data, make request on your firm's letterhead.

TENNESSEE

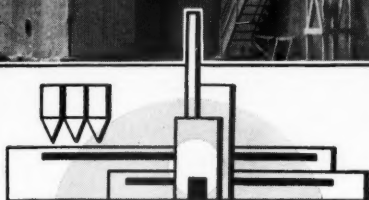
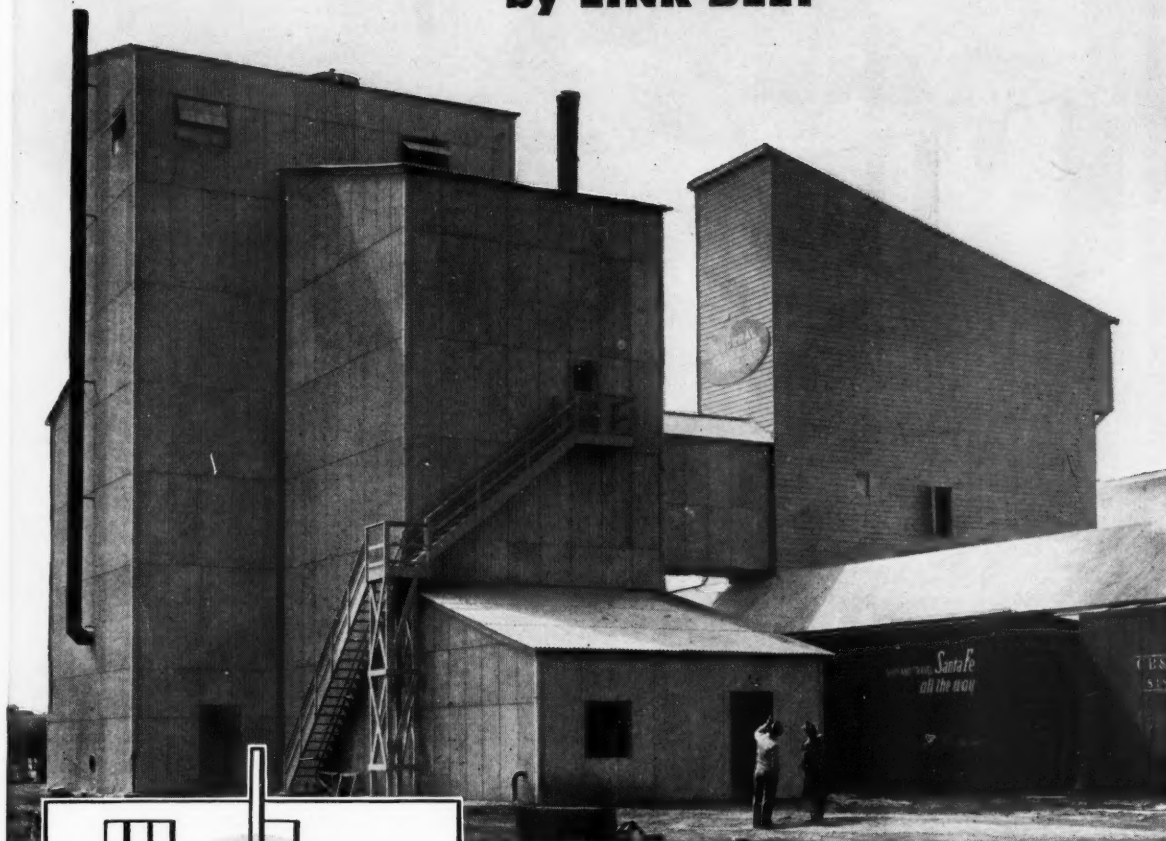


CORPORATION

617-29 Grant Building, Atlanta, Georgia

3rd GRANULAR FERTILIZER PLANT

furnished for Federal Chemical
by LINK-BELT



LINK-BELT "turn-key" SERVICE
unlocks new efficiencies in
fertilizer production

**Under this inclusive 5-point
program, LINK-BELT will:**

- 1. PILOT THE PROCESS**, using our complete laboratory and test facilities.
- 2. DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
- 3. FABRICATE THE EQUIPMENT.** Link-Belt makes a complete line—will also supply special requirements.
- 4. ERECT THE PLANT**, providing crews and supervisory service.
- 5. START THE OPERATION**, with field engineers ready to make final adjustments.

40 TONS OF MIXED FERTILIZER are produced hourly at Federal's new Danville (Ill.) plant. Process utilizes anhydrous ammonia and ammonium nitrate solutions.

Supplies handling and processing equipment to put TVA continuous ammoniator system "on stream"

PROVED in two previous Federal Chemical Company plants, Link-Belt equipment was chosen for a third installation. And this same top performance and efficiency was achieved to produce top-grade fertilizer at low cost.

Link-Belt will work with your own constructors to design and equip a new plant—or modernize your present system. Or we can handle complete erection under

a single "turn-key" contract.

Link-Belt offers a complete line of handling and processing equipment plus broad experience in the production of every type of fertilizer. Whether you produce dry-mix, superphosphate, ammonium phosphate, ammonium nitrate, ammonium sulphate, urea or granular—call your nearest Link-Belt office. Or write for Book 2459.

LINK-BELT

PLANTS AND EQUIPMENT FOR THE FERTILIZER INDUSTRY

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

14,229



MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

61 BROADWAY * NEW YORK 6, N. Y.

Calendar

- Sept. 5-7.** Nat'l Agricultural Chemicals Assn. 23rd annual meeting, Essex and Sussex, Spring Lake, N. J.
- Sept. 18-19.** 130th Nat'l Meet., Am. Chem. Soc., Atlantic City, N. J.
- Oct. 9.** Western Agricultural Chem. Assn. Fall Meeting, Villa Hotel, San Mateo, Cal.
- Oct. 15.** Fifth annual chemical sales clinic sponsored by Salesmen's Assn. of the American Chemical Industry, Hotel Commodore, New York City.
- Oct. 16-17.** National Nitrogen Solutions Assn. annual meeting and trade show, City Auditorium, Sioux City, Iowa.
- Oct. 16-18.** Fert. Ind. Round Table, Shoreham Hotel, Washington, D. C.
- Oct. 18-19.** Assn. of American Fert. Control Officials meeting, Shoreham Hotel, Washington, D. C.
- Oct. 22-26.** 44th National Safety Congress and Exposition, sessions in Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago.
- Oct. 23-24.** Pacific N. W. Garden Supply Trade Show, Shrine Auditorium, Portland, Ore.
- Oct. 25.** Mid-West Soil Improvement Committee, Sherman Hotel, Chicago, Ill.
- Nov. 2.** Joint Agronomy Industry Work Conference, Atlanta Biltmore Hotel, Atlanta, Ga.
- Nov. 7-9.** Agr. Ammonia Institute Annual Convention, Atlanta Biltmore Hotel, Atlanta, Ga.
- Nov. 7-9.** Pacific Northwest Plant Food Assn. Annual Convention, Harrison Hot Springs Hotel, Harrison Hot Springs, B. C.
- Nov. 11-13.** Calif. Fert. Assn., 33rd Annual Convention, Del Coronado Hotel, Coronado, Cal.
- Nov. 18-20.** Midwest Garden Show, Navy Pier, Chicago, Illinois.
- Nov. 19-20.** Eastern Branch, Ento. Society of America, Hotel Haddon Hall, Atlantic City, N. J.
- Nov. 27-28.** Indiana Fert. Conf., Memorial Union Bldg., Purdue University, Lafayette, Ind.
- Nov. 28.** Okla. Fert. Dealers Conf., Okla. A & M College, Stillwater, Okla.
- Nov. 29.** Okla. Soils and Crops Conf., Okla. A & M College, Stillwater, Okla.
- Dec. 27-31.** Ento. Society of America, Annual Meet., Hotel New Yorker, N.Y.C.



2,048 Tons per Day

Chemical and fertilizer plants far and wide report exceptional satisfaction with the performance of the new "PAYLOADER" models. They not only handle more tonnage than earlier "PAYLOADER" machines, but are way ahead of other front-end loaders in design and the features which make them MORE PRODUCTIVE.

Whether you have a large-tonnage application like the one pictured*, a boxcar unloading need, or applications in between — indoors or outdoors — there is a "PAYLOADER" size to fit your requirements. And there is a nearby Hough Distributor with complete sales-service facilities ready to work with you.

**A 4-wheel-drive "PAYLOADER" with 2 cu. yd. bucket loading trucks with 256 tons of sulphur per hour.*



PAYLOADER®

MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



Dig More—Powerful 40° bucket tip-back at ground level gets heaped loads quickly and easily with less spillage loss.

Carry More—Low, close load-carry position, plus hydraulic load shock absorber permit carrying more at higher speeds.

Deliver More—Since they get more to begin with and can carry more — at higher speeds — they deliver more tonnage, at lower cost.

THE FRANK G. HOUGH CO.

704 Sunnyside Ave., Libertyville, Ill.

- ☐ Send data on Model HA (18 cu. ft.)
- ☐ Send data on Model HAH (1 cu. yd.)
- ☐ On larger models up to 2 1/4 cu. yd.

Name _____

Title _____

Company _____

Street _____

City _____

State _____

GOVERNMENT

TVA Lowers Price of Amm. Nitrate

Delivered costs of TVA ammonium nitrate are being adjusted to provide more uniform price incentives to dealers and farmers taking part in its distributor demonstration program.

Seventy-two distributors with about 4,000 retail outlets are co-operating with land-grant colleges in 35 states toward TVA's stated objectives of introducing and developing markets for better fertilizers, lowering plant nutrient cost to farmers and demonstrating improved fertilization practices.

Delivered cost of the ammonium nitrate to farmers, in general, is to be about \$5 to \$6.50 below commercial ammonium nitrate, the agency reported.

ICA Authorizations

Cambodia. \$6,000—agricultural pesticides (PIO/C No. 42-11-207-5-60094.1). Source: World wide. Terminal delivery date: Oct. 31, 1956. Procurement through Emerg. Procurement Serv., GSA.

Vietnam. \$25,000—agricultural pesticides (PIO/C No. 30-82-075-5-60326). Source: World wide. Terminal delivery date: Dec. 31, 1956. Procurement through Emerg. Proc. Serv., GSA.

New Division for Forest Pest Control

All control work on forest insects is now under one division of the Forest Service—Forest Pest Control Div. Responsible for USDA's activities in controlling insect infestations, disease epidemics and white pine blister rust control, the division is headed by Warren V. Benedict, formerly in charge of the white pine blister rust control program.

Since most of the work will be done cooperatively with state foresters and other public agencies or private land owners, the division will be under the general supervision of W. S. Swingler, assistant chief of the Forest Service in charge of cooperative programs. Swingler reported that insects kill seven times as much timber as fire, and diseases three times as much.

'Animal Diseases' Ag Yearbook Issued

The 1956 Yearbook of Agriculture, "Animal Diseases," is now off the press. Containing 134 chapters by leading veterinarians and other scientists, it can be purchased for \$2 each from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

USDA to Aid Great Plains Soil Cons.

USDA will be able to cooperate more extensively with the 10 Great Plains states in furthering their conservation programs since amendments to the Soil Conservation and Domestic Allotment Act and the Agricultural Adjustment Act of 1938 have been signed into law by President Eisenhower, the department reports. The Great Plains Council has long studied the problems and has developed recommendations for the area.

The Secretary of Agriculture is authorized to enter into conservation program contracts with Great Plains states farmers and ranchers for periods up to 10 years. Appropriations amount to \$150 million for the authorized 15-year period; not to exceed \$25 million in any one program year.

Pennsylvania Gets New Fertilizer Law

A minimum of 20 per cent plant nutrients for mixed fertilizers and 18 per cent for superphosphates are reported required under the new Pennsylvania fertilizer legislation and publication of false or misleading statements concerning agricultural value of the product is made illegal. Sellers have until next June to dispose of present stocks which do not meet the new requirements.

Penalties include (1) for shortweighing a customer—penalty equal to twice the value of the actual shortage. Fine of \$50 to \$100 for first or second violators and up to \$1,000 and one year in jail for three offenses within a year. (2) Where average guarantees are not met, seller must reimburse purchaser for value of the difference. Inspection fee is two cents a ton.

House Comm. Votes On Phos. Lands Limit

A House committee has voted to increase to 6,400 acres the limit on the amount of public lands any one company or person may lease from the government in a single state for development of phosphate deposits. Opposition to the bill is reported probable if called up on the floor for passage.

No Surplus Support Crops on TVA Land

A provision prohibiting the growing of price-supported crops in surplus supply will be included in future licenses for agricultural use of Tennessee Valley Authority reservoir land, except that licensed to Federal and state agencies for the production of food for wildlife. Among the prohibited crops are corn, cotton, rice, peanuts (except Virginia and Valencia), wheat (except Durum Class II) and tobacco.

TRACTOMOTIVE TL-10 TRACTO-LOADER

Capacity — 1 cu yd
Horsepower — 63
Reach — 2 ft, 7½ in. (at
8-ft dumping clearance)
Weight — 11,700 lb



... in this low carry position the load is "tucked in" close to the cowl,

LOW CARRY... SHORT TURNING... HIGH LIFT

More output on every materials handling job

You can scoop up a heaping load and carry it low without spilling with the Tractomotive tip-back bucket. In this low carry position, the load is "tucked in" close to the cowl for better balance and visibility... easier maneuvering. Short turning radius enables the TL-10 to turn from a 9-ft aisle into a 10-ft bin without jockeying. It easily loads into high dump bodies or hoppers... and there's *extra long reach* because tires do not extend ahead of cowl. But these are just a few of many TL-10 advantages.

Hydraulic torque converter drive lets you crowd stead-

ily into the pile — engine torque is multiplied three times. Tip-back feature gives a scooping action that fairly tumbles material into bucket. With clutch-type transmission, you pull a lever and move away from the pile on the double without time out for shifting. Reverse is almost twice as fast as forward. Bucket over drive wheels utilizes weight of loaded bucket for greater traction while it eases weight on rear wheels for easier steering.

Make an appointment for a demonstration. See how these big-production features will help you increase output.

SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER

Send for Free Descriptive Catalog on
the Complete Line of Tracto-Loaders

TRACTOMOTIVE

TRACTOMOTIVE CORPORATION • DEERFIELD, ILLINOIS

TRACTOMOTIVE CORP., Dept. FC
Deerfield, Illinois

- ☐ Please arrange a demonstration
of TL-10.
☐ Send Catalog.

Name
Title
Company
Address
City State



New Home of Geigy Agricultural Chemicals

● Geigy Agricultural Chemicals' modern new headquarters now combine administrative offices, service facilities, and chemical research and development laboratories.

All of these facilities in one location constitute another step forward to serve you better and more efficiently.



GEIGY AGRICULTURAL CHEMICALS • Division of Geigy Chemical Corporation • Saw Mill River Road, Ardsley, New York
Mail address: P. O. Box 430, Yonkers, New York Telephone: HAstings 5-8211

DIAZINON

The most effective residual fly control chemical available. One spraying kills flies from 4 to 6 weeks.

METHOXYCHLOR

General purpose insecticide. For control of insect pests of livestock, crops, and stored grain. Safe to use. Long residual action.

CHLOROBENZILATE

Safe, effective miticide. Controls mites on apples, pears, citrus, and ornamentals. Long residual action.

SEQUESTRENE*

Original iron chelates for correction of iron deficiency (chlorosis) in ornamentals, fruit trees, vegetables, and turf.

*"SEQUESTRENE" is the brand name for metal chelates sold by Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation

DDT

Controls a variety of insect pests of man and animals. Equally effective against many insects attacking ornamentals and agricultural crops.



ORIGINATORS OF DDT INSECTICIDES

VIEWING WASHINGTON

with Farm Chemicals
Washington Bureau

on agriculture

The trend toward increased use of higher-analysis fertilizers continued in 1954-55, according to the Agriculture Department. This extends a long-time trend, sets a new record, and makes the 16th consecutive year for increased use of the primary plant nutrients.

NPK Consumption increased 3.8 per cent during the past year over the consumption of the previous year. The 6.2 million tons of plant nutrients contained in the 22.7 million tons of fertilizers sold was an increase of about 224,000 tons over a year earlier. Nitrogen increased about 113,000 tons (6 per cent), available phosphoric oxide 50,000 tons (2.2 per cent), and potash 61,000 tons (3.4 per cent).

The increased use of NPK occurred in the face of a decrease in tonnage of fertilizers used. The consumption of all fertilizers in the year ended July 30, 1955, was 99.8 per cent of the previous year's consumption.

Gasoline used in airplanes for spraying, fertilizing and planting on farms is eligible for the farmers' tax refund approved by Congress this year. Internal Revenue says the 3-cent-a-gallon Federal tax refund applies to hired planes and other hired vehicles used for farm purposes.

Financially-hard-pressed farmers get a big boost from recent loan legislation. For the first time, the Farmers Home Administration can extend credit to farmers for refinancing existing debts. This is a break for the growing number of farmers who have accumulated a lot of relatively short-term debts and are having trouble meeting payments.

The three-year program of wholesale down-grading of price supports now has come to an end. This means that the farm income picture for the first time in five years has a solid under-pinning under it. Economists are predicting a slow but steady rise in spendable income.

When it continued wheat supports at \$2 per bushel in 1957, the Administration committed itself publicly to a hold-the-line policy across-the-board in price supports. Until then, the Government had steadily whittled away at price supports as a means of reducing surplus output.

As a result, USDA planners say price supports for other major crops, including corn and cotton, in 1957 will be continued at or very near 1956 levels.

President Eisenhower came off exceptionally well on farm legislation in the 1956 Congress. Out of the 9-point program he presented lawmakers in January, Congress acted more or less favorably on eight and turned down only one.

Here's the final box-score: (1) Soil Bank came a little late, but with most of what Ike wanted; (2) More surplus disposal money and authority was granted than Ike requested; (3) Flexible price support principle was upheld; (4) The dollar limit on supports as advocated by Ike was turned down; (5) Rural Development program got a slight, unenthusiastic shot in the arm; Most of the Great Plains development program was approved; (7) Research funds were increased; (8) Farm credit was liberalized and eased about as requested; and (9) The Federal gas-tax refund to farmers was passed.

VIEWING WASHINGTON

on business

The 1957 Soil Bank program now has been pretty well set up. The Acreage Reserve is an extension of the emergency 1956 program. Under this, farmers are paid relatively high prices by the Federal government for under-planting cotton, corn, wheat, peanuts, rice and tobacco—the allotment crops. The Conservation Reserve is entirely new. It pays an annual rent averaging \$10 an acre for other cropland taken out of production, plus a Federal share of installing certain approved conservation practices.

Here is a run down of Soil Bank provisions:

Acreage Reserve: So far only specific details for winter wheat growers have been announced. But details for other crops, to be announced later, generally will be the same. Wheat growers have until September 21 to sign up land for this reserve. No payments will be made for plowing under any crop, such as were made this year. Farmers will have to prove intention to participate in order to get the payment of \$1.20 a bushel times normal yield on land taken out of production.

Payments for corn, wheat and rice will be in cash or grain from Government stocks with a premium to farmers who keep the same tract of land in the reserve in 1958 and 1959 as in 1957. No premiums will be made for keeping identical 1956 land in the 1957 program. A maximum of 50 acres wheat land or 50 per cent of allotment can be put into the reserve.

Conservation Reserve: It is in this reserve where greatest opportunities for fertilizer sales occur. For example, since the 1957 program has been announced at this early date, there is opportunity for making considerable increase in sales this fall.

Farmers can still start this part of the Soil Bank this year—by signing long-term contracts before October 15. But most will want to start in 1957, and will have to sign contracts before March 15, 1957. Contracts run for varying periods: 3-5 years for land already in cover crops, 5-10 years for land requiring conservation practices and 10-15 years for land on which trees are to be planted. To get Federal conservation cost-sharing payments, farmers must sign contracts running at least five years.

Any cropland is eligible for this reserve if it has been regularly used for crop production, including tame hay, but excepting land in the Acreage Reserve. Entire farms may be signed up. Maximum land rent payment in most cases to any one farmer in any year is \$5,000.

A "farm Soil Bank base" will be set up for each participating farm. This is the average acreage devoted to production for harvest in the two years prior to signing of a contract. For every acre put in the reserve, the farmer will have to reduce one from active production.

The government's new program to find new industrial uses for farm products is expected to move primarily in the field of grain alcohol. And especially methods of increasing industrial uses for conversion to plastics, motor fuels and synthetic rubber. Head of the newly-created Commission on Industrial Uses of Agricultural Products, is J. LeRoy Welsh, a long-time crusader for increased use of grain alcohol in industry.

A new investigation of steel distribution problems affecting small business will be made this fall and winter by the Senate Small Business Administration.

Chemicals

280—Livestock Sprays

Crag fly repellent will add effectiveness, economy and safety to your livestock sprays, according to Carbide & Carbon Chemicals. The material improves effectiveness of insecticides such as methoxychlor and pyrethrins and protects stock from flies. It is less toxic to animals than any other commonly used fly spray ingredient. For more information on this repellent and formulations with various insecticides

CIRCLE 280 ON SERVICE CARD

281—Soil Insects

Velsicol offers a small booklet describing the action of soil insects and their control. Four pages are used to picture and describe a number of major soil insects found in the United States with notes on the major crops attacked by each. For your copy

CIRCLE 281 ON SERVICE CARD

282—Polyfon Dispersants

Bulletins are available from West Virginia Pulp & Paper describing the versatility of its Polyfon dispersants for wettable powders. The quantity used varies with type of insecticide and concentration but is usually $1\frac{1}{2}$ to 3 per cent of total weight. All grades are free flowing with excellent storage stability and resistance to caking. For your copies of the bulletins

CIRCLE 282 ON SERVICE CARD

283—Aero Cyanamid

Aero cyanamid granular, says American Cyanamid, will be a profitable addition to your product line. In tobacco areas, growers can obtain better weed control and healthier plants which grow off faster in the field, saving time and labor. There are many other uses—for vegetables started in plant beds, plow-under with plant wastes to make humus and pre- and post-emergence weed control. For complete information and sales literature

CIRCLE 283 ON SERVICE CARD

284—Sinclair Nitrogen

If you are a Mid-West user of nitrogen products you may save money on 1956 contracts by considering Sinclair as a supplier. Completion of the firm's new Hammond, Ind. plant means a sharp reduction in freight costs for many Mid-West areas. The facilities and huge storage capacity make it possible to meet your schedule—even during peak season and two tank car fleets are ready—one for exclusive use in shipping NH_3 , the other for nitrogen solutions. For information

CIRCLE 284 ON SERVICE CARD

FREE INFORMATION to help you
solve fertilizer, pesticide problems

Reader Service

Process Equipmt.

285—Diaphragm Valves

Grinnell-Saunders says that its diaphragm valve, initially designed to eliminate costly leakage and maintenance in compressed air lines, is now widely used wherever corrosion contamination and maintenance are problems—particularly in lines handling corrosive fluids, gases and suspended solids. A new eight page booklet describes the various styles available and provides specifications.

CIRCLE 285 ON SERVICE CARD

operation. Dust is prevented by a continuous upward air current that prevents build-up of fines and carries ground materials to a classifier. For full details

CIRCLE 287 ON SERVICE CARD

288—Process Units

A brochure issued by Swenson Evaporator describes unit operations such as evaporation, crystallization, filtration and spray drying as a means to reduced costs and improved quality. It depicts actual installations in industries including the fertilizer field and describes Swenson activities from consultation to service.

CIRCLE 288 ON SERVICE CARD

Materials Handling

289—Payloader Bulletin

An informative bulletin from Frank G. Hough Co. describes and illustrates a wide variety of industrial materials-handling applications for Payloader tractor-shovels. It also provides specifications on the complete Payloader line and a map showing locations of over 200 distributors where the units are sold and serviced.

CIRCLE 289 ON SERVICE CARD

290—B-G Conveyor Idlers

Barber-Greene deep trough belt conveyor idlers are described in a new four page bulletin. Especially designed for handling lightweight bulk materials, the units are available in 24 to 48 inch belt widths and in 5 or 6 inch roll diameter. Ball bearings or tapered roller bearings can be furnished.

CIRCLE 290 ON SERVICE CARD

291—Titan Pallets

With palletizing a standard practice in so many plants, Titan expendable units will be of particular interest when you're trying to cut shipping and warehousing costs. Each carries a one ton load, can be handled just as a wooden pallet and stacks 4-high when loaded. Weighing four pounds they are shipped knocked down and can be wire stitched or stapled as needed, in seconds. For a descriptive folder

CIRCLE 291 ON SERVICE CARD

How to use the READER SERVICE CARD

- Circle number of literature you want.
- Print or type your name, position, company and address.
- Clip and mail the Service Card.

286—Gravimetric Feeder

Omega Machine's gravimetric feeder is an accurate dry materials unit for medium feed rates. It offers feed rates to two cubic feet per minute and accuracy within 1 per cent by weight over full 100 to 1 feed range. Features include a large weight-sensing section, non-flood rotor, Sens-A-Gram controller, rapid rate setting and elimination of belt slippage or training. For a bulletin

CIRCLE 286 ON SERVICE CARD

287—Precision Grinding

Williams roller mills provide automatic precision fine grinding, from 20 mesh to micron sizes. Operation is completely automatic and adjustment for size control can be made instantly while the mill is in

292—Tight-Lip Buckets

You can prevent contamination in handling operations with Blaw-Knox tight-lip buckets, says the manufacturer. The units are equipped with tight-fitting cast steel lips to cut leakage of granular fines. Blaw-Knox has a brand new bulletin on its lever arm buckets. For a copy

CIRCLE 292 ON SERVICE CARD

293-4—Towmotor Data

Two new Towmotor booklets offer information for both lift-truck buyers and operators. A 32-page booklet describes the new Pace-Maker series fork lift trucks including four new additions to the line. An attractive pocket-sized Operator's Manual has also been issued and covers subjects of special interest to owners and operators including Towmotor specifications and features, operating instructions, safety tips, handling techniques and preventive maintenance procedures.

CIRCLE 293 FOR PACE-MAKER BOOKLET

CIRCLE 294 FOR OPERATOR'S MANUAL

Packaging

295—Packaging Work Kit

Union Bag offers a handy Do-It-Yourself packaging work kit designed to help fertilizer manufacturers figure complete bagging costs. The kit contains tables for determining labor costs per ton of material and per thousand bags at varying production costs and also includes a chart which figures the cost of multiwall bag closing materials as well as a bag cost comparison sheet. For a copy of the kit, plant food producers can

CIRCLE 295 ON SERVICE CARD

296—Marking Equipment

Industrial Marking Equipment provides the units for production line marking, dating and coding multiwall bags, cartons, containers, drums, pails and cans. The equipment is engineered to lower costs and provide high speed, economical service. For a new catalog describing the IME line

CIRCLE 296 ON SERVICE CARD

297—Pasted Valve Bag

The new St. Regis pasted valve bag has been well received by packers of granulated fertilizers, according to the manufacturer, and features an insert sleeve that closes securely against the squared bag top for less sifmage, cleaner packages. The squared top provides more room for your brand imprint and instructions and permits better stacking and loading. For information

CIRCLE 297 ON SERVICE CARD

298—Magnetized Multiwalls

A new high in slip prevention is claimed for Hudson Pulp & Paper's Magnetized coating for multiwall sacks. The coating holds in tilt tests up to 40° and can be added for pennies. For details and a test sample folder

CIRCLE 298 ON SERVICE CARD

Application

299—Blue Equipment

John Blue NH₃ application equipment features the well-known Blue vapor operated transfer pump which brings you savings of up to 95 per cent. The Blue line includes Nitro-Shooter applicators in a variety of capacities, a special unit for corn fields with 33" crop clearance and a Nitro-Shooter Universal with coulters and tines designed to penetrate heavily sodded pastures. For complete information

CIRCLE 299 ON SERVICE CARD

300—Liquijector Applicators

Dempster Liquijectors are available to meet any need in applying anhydrous ammonia or nitrogen with capacities ranging from 60 to 300 gallons. A new addition to the line is a 3-point hitch hydraulic lift applicator that covers up to 14 feet, capable of doing a bigger job with less tractor power. For a new Liquijector booklet

CIRCLE 300 ON SERVICE CARD

Miscellaneous

301—Electrolized Roller Chain

Atlas Electrolized roller chain has been developed to meet conditions where corrosion is an important factor yet costs

less than other corrosion resistant chain. It has the same tensile strength as alloy steel chain and friction of parts has been greatly reduced to cut wear, increase chain life. For data, manufacturers can

CIRCLE 301 ON SERVICE CARD

302—NH₃ Mask

The anhydrous ammonia mask produced by Mine Safety Appliances will safeguard your personnel from ammonia vapors. It has been accepted by the U. S. Interdepartmental Committee on Pest Control. For details

CIRCLE 302 ON SERVICE CARD

303—Rigid Frame Bldgs.

Your plant grounds can have a quality look with rigid frame buildings, says Stran-Steel Corp., structures that feature sturdy frame construction and a strong foundation. An exclusive metal wall provides durable weather resistance and peaks, gables and eaves are completely enclosed with weather-tight flashing. The frame construction is designed to put assembly bolts primarily in shear rather than tension and, at the foundation, each column is bolted directly to the foundation with U-shaped anchor bolts. Clear span structures are available in widths of 40, 50, 60, 70 and 80 feet and multiples thereof and are built in 20-foot bays. For a catalog

CIRCLE 303 ON SERVICE CARD

304—Grip-Strut Grating

Grip-Strut grating provides a safe, sure footing on work platforms, stair and ladder steps, catwalks, machinery guards and other plant locations. It is fabricated in one piece (including channels) not welded, riveted or expanded, in steel or aluminum. Open space in a diamond pattern is provided in excess of 55 per cent of the area for ready access of light and air and positive non-skid footing in all directions. For a catalog

CIRCLE 304 ON SERVICE CARD

305—Humidity Instruments

Bristol Company's complete line of humidity recording and controlling instruments and accessories are described and illustrated in a new bulletin. The 22 pages contain data on indicating, recording and automatically controlling wet and dry bulk instrument, and direct reading psychrometers. Also included are conversion tables of wet and dry bulb temperatures and psychrometric tables.

CIRCLE 305 ON SERVICE CARD

306—Resistant Coatings

Three general classes of chemical resisting organic coatings are described in a new bulletin from Metal & Thermit. Included are Ucilon coatings systems applied like paint for general corrosion control; Unichrome plastisol compounds for heavy-duty service; and Unichrome special materials for lining steel drums and tanks. For a copy

CIRCLE 306 ON SERVICE CARD

See pages 56 and 57 for information on these Reader Service numbers—

307—Bristol System

308—Whiz Packer Unit

309—Bag Conveyor

310—Fillmaster

311—Remote Counter

312—Clarklift Features

313—Nylon Valves

314—Flow Computers

315—Pallet Bags

Presenting
THE MOST MODERN
BAG PRINTER

Manufactured in
One, Two, Three and Four Colors for
printing made up bags of Paper,
Cotton and Burlap, new or used.



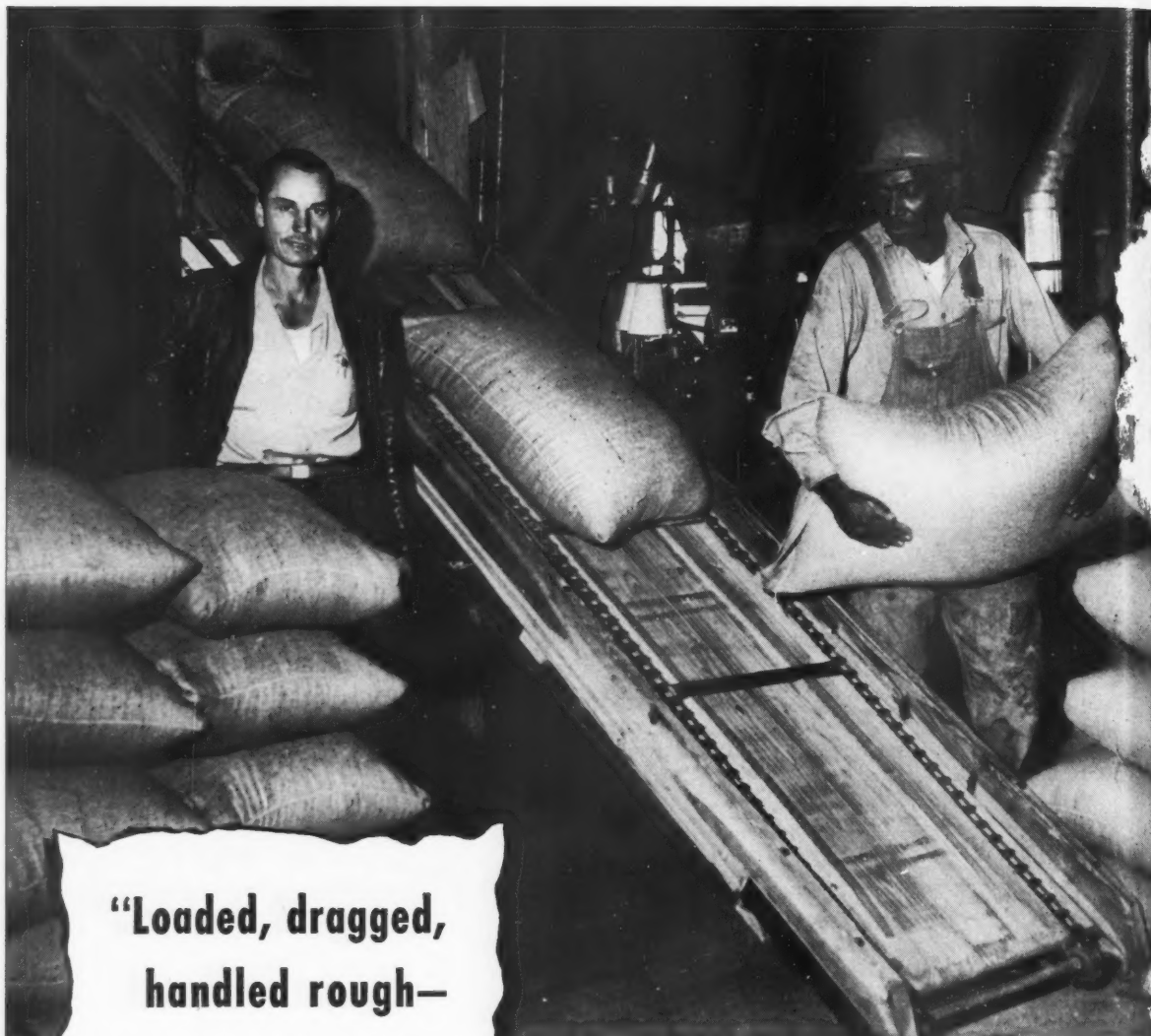
Let us send you complete information with descriptive literature.

SCHMUTZ
MFG. CO.

18th and Main Streets
Zone 3

Louisville, Ky.

Cable Address "SCHMUTZ"—Long Distance Phone CLAY 7771



"Loaded, dragged, handled rough—

burlap bags take a terrific beating," says Fred W. Schroer of Valdosta, Georgia. "We buy about 480 tons of fertilizer a year in burlap bags we don't have to coddle. They can absorb moisture if a sudden rain comes up, and good air circulation cuts down mold.

"We wash the bags right away and use them for everything on the farm. In our hopper for grain we can bag with burlap in record time. We ship seeds all over the country in burlap bags and know they'll reach their destination in good condition."

You can sell more fertilizer when you pack in burlap bags because they make the farmer's work easier and they have *so many uses* around the farm.

Just ask your own customers— they'll tell you that burlap



Is strong—takes dragging, dropping, man-handling—any tough job on the farm.



Gives good ventilation—keeps farm supplies and products fresh.



Laughs at sudden showers—wetness or dampness can't weaken it.



Saves money—extra value from re-sale and re-use.



Saves storage space—stacks to any height without slipping.



Has 1000 uses—always in demand on the farm (popular with farm wives, too!)

THE BURLAP COUNCIL

of the Indian Jute Mills Association
155 East 44th Street, New York 17, N. Y.

High Speed Reduction to Micron Sizes — No Attritional Heat!

An ideal Grinder for the production of Insecticide Compounds from DDT, Aldrin, Dieldrin, BHC, etc.

The increased surface area from this type of grinding means greater bulk, for better dispersion and wettability, requiring less amount of wetting agent.

ENGINEERING FLUID-JET GRINDING IN "PACKAGE UNITS"

... comes naturally to Sturtevant engineers — with their 75-year tradition of successful solving of dry-processing problems. If you want to accomplish the most effective grouping of a Micronizer* Grinding Machine with necessary compressor, feeder and dust-collector, it will pay you to investigate. Check the coupon on the right for more information.



Sturtevant Micronizer* Grinding Machines Give Greater Finenesses than Tube or Roller Mills

Look at the record! 30 inch model reduced titanium dioxide to 1 micron and finer at solid feed rate of 2250 lbs. per hr. 24 inch model reduced DDT (50%) to 3.5 average microns — 1200-1400 lbs. per hr. 8 inch model reduced Procaine—Penicillin—to 5 to 20 microns—up to 20 lbs. per hr. Couldn't you use milling performances like these?

No moving parts. The particles grind each other. High-speed rotation and violent grinding impact of particles are caused by jets of compressed air or steam at angles to the periphery of the shallow grinding chamber. There are

no problems of attritional heat. Centrifugal force keeps over-sized particles in the grinding zone. Cyclone action in the central section classifies and collects the fines for bagging.

Instant accessibility, easy cleaning. Micronizer* Grinding Machines come in seven sizes — each one constructed for quick accessibility and easy maintenance (typified by the "OPEN DOOR" design in other Sturtevant equipment). Grinding chambers range from the 2 in. laboratory size with ½ lb. per hr. capacity to the 30 in. size which handles up to 3000 lbs. per hr.

* Registered trademark of Sturtevant Mill Co.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are:

Desired capacity is:

Name _____ Title _____

Firm _____

Street _____

City _____

Zone _____ State _____

STURTEVANT MILL COMPANY 140 Clayton Street, Boston 22, Mass.

Please send me your Micronizer* Bulletin ☐

Also bulletins on machines for:

- | | | |
|--|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> CRUSHING | <input type="checkbox"/> GRINDING | <input type="checkbox"/> PULVERIZING |
| <input type="checkbox"/> SEPARATING | <input type="checkbox"/> BLENDING | <input type="checkbox"/> MIXING |
| <input type="checkbox"/> SUPERFINE SELECTING | <input type="checkbox"/> GRANULATING | <input type="checkbox"/> CONVEYING |

SULPHUR

helps to create **HEADLINE** products



PAVING

FLOTATION
OILS

INKS

VARNISHES

TALL-OIL

CLOTH

CUTTING
OILS

RUST-PROOF
COMPOUND

PAINT

SOAP

New uses are popping up everyday for this refugee from the skimmings of kraft mill black liquor. Tall Oil is fast becoming the antidote to a lot of supply shortage headaches and cost problems.

Tall Oil is extracted from black liquor skimmings with the aid of sulphuric acid. Some interesting experiments in connection with

the refining of Tall Oil involve the use of sulphuric acid at subzero (centigrade) temperatures. Most applications of sulphuric acid are at room temperature or higher.

Here is a relatively new product, certainly a 'headline' product, and it requires a derivative of Sulphur in the reactions that make it!



Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N.Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units

- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

FARM CHEMICALS



Here is a new high in preventing slippage. You can't see Hudson's "Magnetized" coating, or feel it. But it is applied uniformly to every square inch of every surface of the bag. When stacked, "Magnetized" sacks actually clutch each other.

Standard tilt tests show firm holding power up to a 40° angle. Costing only pennies in upcharge, "Magnetized" Multiwalls can save you dollars in usage.

You save in breakage, you save in time,

you save in possible injuries. And, most practical, you save in space because *both you and your customers can now stack higher with safety.*

Let us demonstrate this safer finish. Write Dept. 29 for convincing "do-it-yourself" test.



HUDSON PULP & PAPER CORP.

477 Madison Avenue • New York 22, N. Y.

Plants at:

PINE BLUFF, ARK. • PALATKA, FLA. • WELLSBURG, W. VA.

NACA Program

EFFECTS of the Federal highway program and a discussion on who and what influences the grower in purchasing pesticides will be featured in panel discussions at the National Agricultural Chemicals Association convention, September 5-7 at Spring Lake, N. J. Some 500 industry members, government workers and representatives of other fields are expected to attend the 23rd annual meeting.

Three top authorities are scheduled to discuss effects of the highways bill on the pesticide industry—Jack Dreessen, NAC herbicide specialist; Dr. C. O. Eddy, Niagara Chemical Div.; and R. J. McMahon, McMahon Brothers. Eddy is chairman of the American Road Builders Association, Roadside Maintenance Subcommittee on Chemicals and McMahon's firm is engaged in commercial spray application work.

M. R. Budd, Hercules Powder's advertising manager, will moderate the discussion on who and what influences growers to buy and use pesticide materials. Included on the panel will be W. A. Haffert, editor, NEW JERSEY FARM and GARDEN; John McDonald, president, National Association of Television and Radio Farm Directors; Blanchard Smith, vice president and director, Chipman Chemical Co.; Ellsworth Fisher, extension entomologist, University of Wisconsin; and a leading pesticides dealer.

A third panel group—Winton B. Rankin, assistant to the commissioner, Food and Drug Administra-



W. W. Allen, NACA President

tion; John Coyne, assistant head, Pesticide Regulation Section, Plant Pest Control Branch, USDA; Dr. Geo. C. Decker, entomologist and head, Section of Economic Entomology, Illinois Natural History Survey; and J. A. Noone, NAC technical advisor, will review latest developments under the Miller pesticide residue amendment.

Also highlighting the three-day affair will be the presidential address by W. W. Allen, manager, Agricultural Chemical Sales, Dow Chemical Co. and NAC president; Dr. E. F. Knipling, chief, Entomological Research Branch, USDA, discussing entomological research; and Jack V. Vernon, president, Niagara Chemical Div., discussing the Industry Outlook. ▲



G. C. Decker



J. A. Noone



W. B. Rankin

FTE...



Tobacco grown on FTE-treated soil.

Trace Elements in Glass

By R. B. Schaal
*Agricultural Division
Ferro Corporation*

IT IS generally recognized that at least six trace elements (iron, manganese, copper, zinc, boron and molybdenum) must be present in adequate amounts to support normal plant development and growth. Through depletion from repeated crop removal, general trace element deficiencies are being aggravated and new deficient areas are continually being created. There probably are, or soon will be, many soil areas where insufficient amounts of all six trace elements are present to support the trend toward high plant population and production and bring out the potential benefits of increasingly high rates of fertilization.

At present, these trace elements usually are applied in the form of soluble salts, either alone or in mixed fertilizers. These materials are not wholly satisfactory for several reasons—possible toxic effects, multiple applications, leaching, physical difficulties in manufacture and unavailability in some of the heavier clay or muck soils.

Ideally, a material is required that will furnish adequate amounts of all needed trace elements in one comparatively small application safely, without leaching or waste, which causes no physical difficulties when incorporated with mixed fertilizers and which will not “tie-up” and become unavailable.

About ten years ago Ferro Corporation of Cleveland, Ohio, became interested in this idea. Since 1921 Ferro has manufactured porcelain enamels, which are essentially soft glasses of highly specialized compositions and properties. Certain types of these enamels contain boron, manganese, cobalt, iron, zinc and molybdenum so Ferro's people were quite familiar with the incorporation of trace elements into

glasses. They also were aware that when these glasses were finely ground they became somewhat soluble in the water in which they were milled. Further, this solubility could be varied and controlled by changing the grinding procedure or the glass composition itself.

From this background of knowledge and experience it seemed probable that glasses containing trace elements could be formulated which, when properly ground, would gradually “weather” in the soil and yield these trace elements at a slow, comparatively uniform rate over an extended period of time.

Now, ten years later, in cooperation with several universities and experiment stations, Ferro has developed Fritted Trace Elements—FTE for short—*slowly soluble* glass, containing iron, manganese, copper, zinc, boron and molybdenum in amounts and proportions which meet the needs of most plants over an entire growing season. The selected ingredients of the glass, including the trace elements, are accurately weighed, mixed, smelted under controlled conditions, quenched (fritted) in water, dried and ground carefully to specification. The trace elements thus actually are an integral part of the glass itself. The composition can be altered, of course, to fulfill varied requirements.

In addition to FTE containing all six of the trace elements mentioned, several variations are available including two boron-manganese mixtures, boron-free frits and a high manganese, boron-free material designed for use on muck soils.

Because the trace elements contained in FTE are slowly soluble, enough may be applied initially to last all season without damage to small, tender plants in the early stages of growth. Multiple, small applications are avoided. It may be used on any rotation without danger to succeeding crops. Since FTE is in the physical form of fine sand and “weath-

ers," or decomposes, slowly, it remains where it is placed in the soil and does not leach nor waste away with heavy rains. FTE does not react with the soil and its trace elements cannot precipitate out in unavailable forms.

Due to its physical form and composition it cannot react with commercial fertilizer and can cause no physical difficulties either in mixing or in storage. Special fertilizer mixes for various crops and soils are seldom necessary.

Probably one of the most illustrative examples of the possible advantages obtainable from trace element materials of the type possessing the properties of slow and controlled solubility is offered by a tomato experiment conducted last winter and spring in the Horticultural Department at Rutgers University.¹ Tomatoes have, of course, been extensively used as test plants in trace element experimental work, and their requirements are fairly well established. They grow rapidly and deficiencies in nutrition are quickly apparent and easily identified.

The tomatoes in this experiment were grown in acid washed sand and every reasonable precaution was taken to exclude all possible uncontrolled sources of either major, secondary or trace element nutrition. The major and secondary elements essential to plant growth, nitrogen, phosphorous, potash, calcium, magnesium and sulfur, were added to all plants equally by means of a carefully prepared standard solution in amounts and at intervals judged to be adequate for optimum growth. The plants were divided into six groups:

Group 1, the "check" plants, received only the standard solution. Group 2, the "control" plants, received, in addition, a second standard solution containing the six recognized trace elements: iron, manganese, copper, zinc, boron and molybdenum in amounts and at intervals judged to be best for optimum growth.

Groups 3, 4, 5 and 6 received no trace element solution but, before the seedlings were placed in the pots, frit was mixed with the sand in varying amounts. Through the growth period no trace elements were added to these plants from any other source, the object being, of course, to determine, through measurement of final yield and foliar analysis, whether the single addition of frit at the beginning would supply trace elements to the plants throughout the season as effectively as the continued small dosage application of the standard solution.

The data, somewhat lengthy and complicated, cannot be given here but they show, in short, that the two frits tested, at 100 pounds per acre, each produced a yield of tomatoes equal to that obtained from group 2 "control" plants, which had the frequent applications of the standard solution.

This indicates, of course, that the single application of frit was adequate to support the plants throughout the growing season. It becomes especially significant when we consider that, had the total amount of standard trace element solution been added at the start of the experiment, the seedlings might well have been killed or severely damaged from toxicity, or that if, after the trace element solution had been added, enough distilled water to simulate a heavy rainfall had been poured on and drained off, most of the trace elements probably would have been leached from the pots and the plants, therefore, at least partially, starved.

Many other equally interesting greenhouse and small scale, closely supervised field tests have demonstrated the valuable properties of fritted trace elements on a wide variety of crops and diverse types of soil over the United States, Canada and England. While tests of this type illustrate the properties of FTE and indicate its potential usefulness, results of large scale trials by commercial growers can best provide the answer to the question of its probable value to agriculture in general.

For the past three years in cooperation with the extension service and the county agents, one-acre survey demonstrations have been conducted by the Agronomy Department of Clemson Agricultural College over the state of South Carolina, in conjunction with the five-acre cotton contest. For this purpose two farms in each county were selected, giving state-wide coverage and involving soils of widely different types.

On this test, one type of FTE gave a state-wide average increase in yield of about 49 pounds of lint cotton per acre,² or about 10 per cent. In terms of money an increase in crop value of more than \$10 per acre was obtained for an expenditure of about \$2. FTE is, as a result, a recommended trace element material for cotton fertilization in South Carolina.

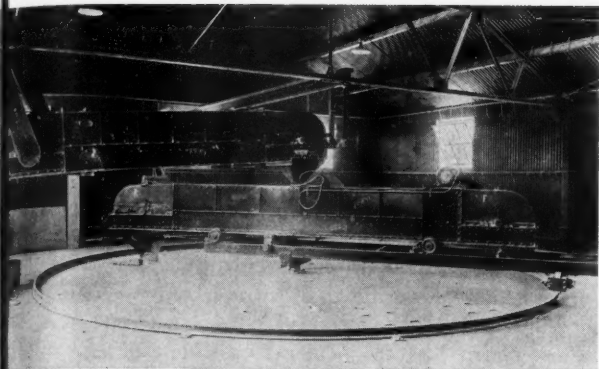
Of particular interest to fertilizer manufacturers is the finding that when FTE is used as the source of trace elements, the need for special fertilizer formulations for each specific crop is eliminated and that fertilizers containing FTE may be used for other crops without any danger of toxicity. The specific recommendation for inclusion in cotton fertilizers is: 30 pounds of frit per ton of fertilizer when the fertilizer is applied at the maximum recommended rate (1,000 pounds per acre). When lower rates of application are used, the fertilizer should contain a sufficient quantity of the frit to supply 15 pounds per acre.

Beans are one of the major crops in the North Platte Valley in Nebraska, where the soil is medium to heavy and highly calcareous, averaging pH 8 to 8.3 in alkalinity. All vegetation in this region tends

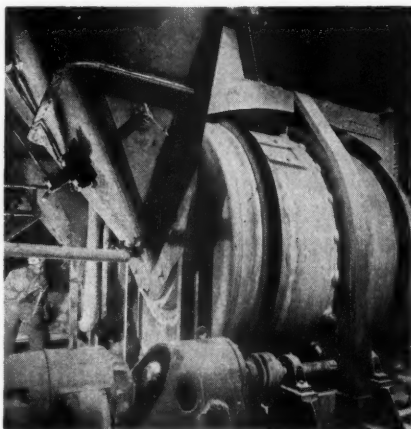
¹ Rufus D. Hubbard. Thesis for Master's Degree, Dept. of Horticulture, Rutgers University, New Brunswick, N. J., Jan. 1956.

² Circular 104, January, 1956, "Minor Elements for Field Crops for South Carolina, 1956" South Carolina Agriculture Experiment Station, Clemson, S. C.

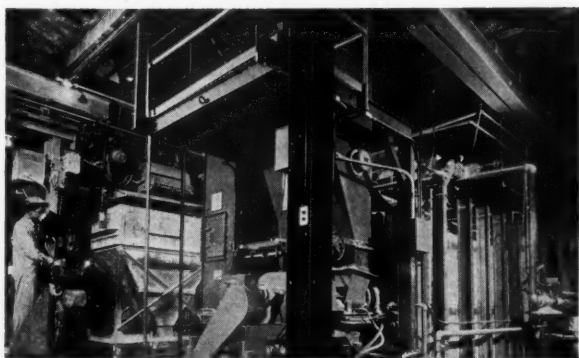
Producing FTE



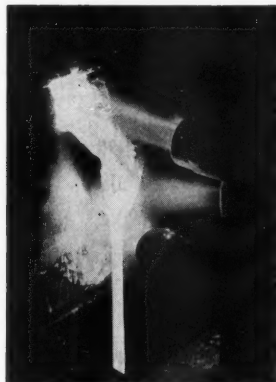
1 Raw materials are delivered by conveyors and bucket elevators to this distributing conveyor on the fourth floor of the mixing building. Each is sent to a storage bin of two-ton capacity.



3 ABOVE. Once proportioned the batch moves via conveyor to a third floor mixer. BELOW. The mixture is taken to a bin over the smelter and is delivered to a screw conveyor which pushes the charge into the back end of the smelter.



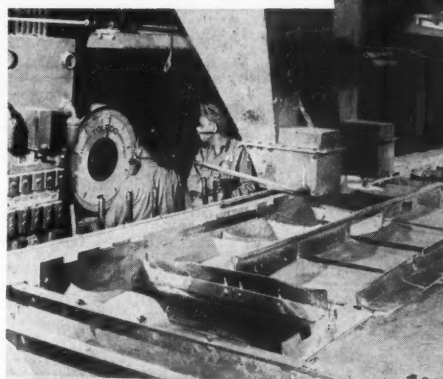
SEPTEMBER, 1956



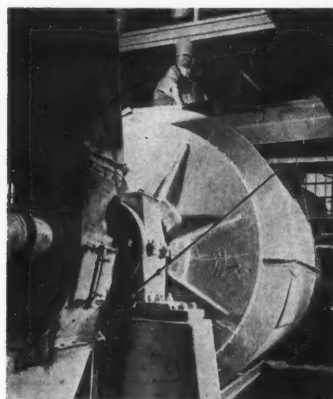
4 Molten glass from the smelter is met by a two inch stream of water, shattering into small particles—frit.



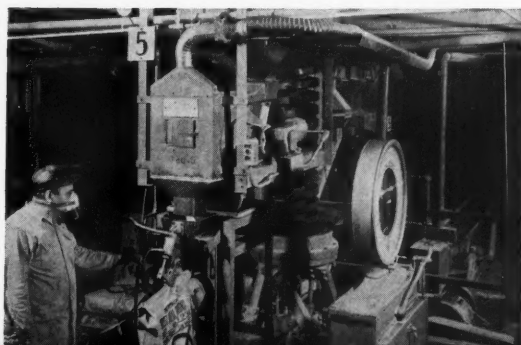
2 ABOVE. Bins extend through the next two floors with noses protruding from first floor ceilings. Car in rear receives materials from bins. RIGHT. Car moves to chute delivering to basement weigh hopper. Scale automatically records and prints weight of all materials delivered.



5 This mill grinds the frit to a powder of definite particle size, delivering to a bagger.



6 The ground frit is packed in 100-lb. multiwall paper valve bags, placed on pallets holding 20 sacks and carried to storage by fork lift truck.



to exhibit iron chlorosis. Irrigation is extensively practiced.

The Chester B. Brown Company is one of the largest growers of beans in the area. In 1953, a year in which all vegetation in the area showed severe chlorosis, this company, in cooperation with the Curry Chemical Company of Scottsbluff, Neb., conducted a large scale field test to determine whether FTE would relieve the chlorosis and increase the yield of beans.³ The land used in this test received no special treatment except application of FTE at 100 pounds per acre to certain parts of the area. The entire area was irrigated.

During the growth period, the bean plants exhibited chlorosis over the untreated areas and produced a yield of 35 bushels of beans per acre. The areas treated with FTE were uniformly green, showed no chlorotic symptoms and yielded 43 bushels of beans per acre, an increase of about 23 per cent.

The Connecticut River Valley produces a large proportion of our shade grown tobacco used for cigar wrappers. The quality of this tobacco must be high, and if it falls below a certain level the crop can no longer be used for this purpose. It is of great economic concern to the growers in this area that the general tobacco quality has gradually deteriorated over a period of years, until it has now reached a point of critical danger.

It is highly significant that after experimenting with increasing amounts of FTE over the past three years, this material is now in general use by one of the most important growers in the area on their entire acreage and that other growers are conducting experiments with a view to including it in their fertilizer program.

The benefits possible through the use of FTE on flue-cured tobacco in certain areas is shown by a field experiment conducted by Mr. Nichols, a grower at Ahoskie,⁴ North Carolina, and reported on by Dr. Jackson B. Hester of Hester Laboratories.

Dr. Hester reports that 1,300 pounds of a 3-9-6 fertilizer was applied per acre. FTE was mixed with the plant food and applied at the rate of 50 pounds of FTE per acre to a portion of a tobacco field.

The grower, Mr. Nichols, made these statements: "Tobacco on the treated area was over one foot taller. Before the tobacco bloomed out, you could

tell right to the row where the FTE was put. . . . After the second topping of the FTE treated area the job was finished, but on the untreated section over 50 per cent of the blossoms still remained to be topped. . . . During the dry season the treated part didn't slam stop (growing). On the area treated with FTE I have made three primings and am getting good leaves, but on the untreated there is nothing much so far."

Observations by others who viewed the plot substantiated Nichols' statements, pointing out that the untreated area was still blooming at the time the treated area had matured. One man noticed that a field planted to peanuts, adjacent to the tobacco, showed visual symptoms of boron deficiency.

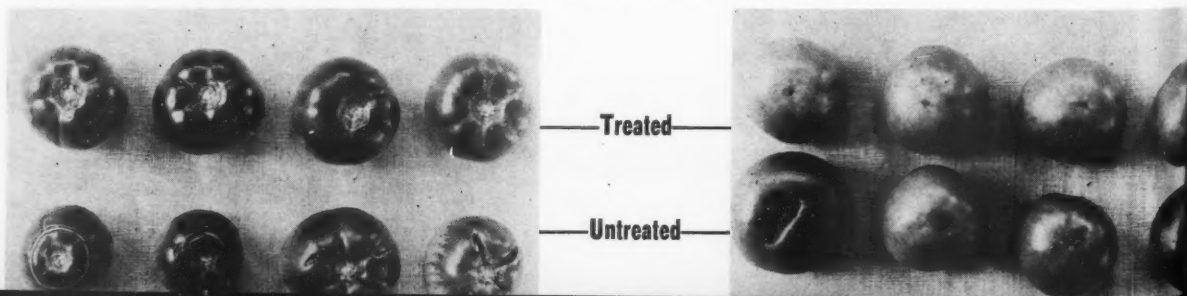
These four large-scale trials are selected because they illustrate well the response to be expected from the use of fritted trace elements on widely diverse soils and crops. Many more such results can be cited, especially with reference to vegetable crops, the benefits being improvement in color and flavor and, usually, improvement in yield.

This discussion of the nature and properties of FTE and the results through its use on extremely diverse soils and crops suggest it as the solution to a wide variety of trace element problems. This great versatility is perhaps best summarized by the Clemson agronomists in the statement that cotton fertilizers containing fritted trace elements may safely be used on all other crops and that the need for special fertilizer formulations for each specific crop is thus eliminated.

Perhaps these agronomic benefits may provide reason enough for the manufacturer to include Ferro FTE in his fertilizers. There are, however, further advantages to be obtained in the manufacturing process itself. Ferro FTE provides all the necessary trace elements in a single, uniform, patented material. Storage space, usually at a premium, is conserved and handling costs are held to a minimum.

It retains its good physical condition throughout storage, even under excessively humid conditions. Ferro FTE mixes uniformly with all commercial fertilizers and fertilizer materials and, as shown by the experience of various large scale users, actually improves the "flow" characteristics of such mixtures. Due to the uniform composition of FTE and its excellent mixing qualities, the trace element content of the mixes will be constant from lot to lot and from bag to bag. ▲

In this test FTE eliminated cracking and blossom end rot on tomatoes



³ Private communication, Mr. Clyde A. Gilna, Curry Chemical Co., Scottsbluff, Neb., dated Feb. 15, 1954.

⁴ Dr. Jackson B. Hester. Consulting Report, dated Aug. 1954.

Farm Chemicals'

Pesticide Tolerance Guide

IN setting up the tables on the following pages, the editors have tried to follow the 27 crop groupings considered by FDA to be related for tolerance and exemption purposes. Each class is considered a single raw agricultural commodity when computing fees. Here are the groupings as announced on April 14, 1956:

1. Apples, crabapples, pears, quinces.
2. Avocados, papayas.
3. Blackberries, boysenberries, dewberries, loganberries, raspberries.
4. Blueberries, currants, gooseberries, huckleberries.
5. Cherries, plums, prunes.
6. Oranges, citrus citron, grapefruit, kumquats, lemons, limes, tangelos, tangerines.
7. Mangoes, persimmons.
8. Peaches, apricots, nectarines.
9. Beans, peas, soybeans (each in dry form).
10. Beans, peas, soybeans (each in succulent form).
11. Broccoli, brussels sprouts, cauliflower, kohlrabi.
12. Cantaloups, honeydew melons, muskmelons, pumpkins, watermelons, winter squash.
13. Carrots, garden beets, sugar beets, horseradish, parsnips, radishes, rutabagas, salsify roots, turnips.
14. Celery, fennel.
15. Cucumbers, summer squash.
16. Lettuce, endive (escarole), Chinese cabbage, romaine, salsify tops.
17. Onions, garlic, leeks, shallots (green, or in dry bulk form).
18. Potatoes, Jerusalem artichokes, sweet-potatoes, yams.
19. Spinach, beet tops, collards, dandelions, kale, mustard greens, parsley, Swiss chard, turnip tops, watercress.
20. Tomatoes, eggplants, peppers, pimentos.
21. Pecans, almonds, Brazil nuts, bush nuts, butter-nuts, chestnuts, filberts, hazelnuts, hickory nuts, walnuts.
22. Field corn, popcorn, sweet corn (each in grain form).
23. Milo, sorghum (each in grain form).
24. Wheat, barley, oats, rice, rye (each in grain form).

Exemptions

These compounds are exempt from the requirements of a tolerance when applied to growing crops, "in accordance with good agricultural practice":

Allethrin. Exempt when used on beans, broccoli, brussels sprouts, cabbage, cauliflower, collards, horseradish, kale, kohlrabi, lettuce, mushrooms, mustard greens, radish, rutabagas, turnips.

Ammonia. Exempt when used after harvest on grapefruit, lemons and oranges.

Carbon disulfide. Exempt when used as a fumigant for barley, corn, oats, popcorn, rice, rye, sorghum, (milo) and wheat.

Carbon tetrachloride. Exempt when used as a fumigant for barley,

(Continued on page 48)

FRUIT

	POME		DRUPE							CITRUS								
	Apples	Pears	Quinces	Cherries	Plums (fresh prunes)	Peaches	Apricots	Nectarines	Citrus Citron	Grapefruit	Kumquats	Lemons	Limes	Oranges	Tangelos	Tangerines	Blackberries	Boysen berries
Aldrin.....	.25	.25	.25	.1	.1	.1	.25	.1	—	.25	—	.25	.25	.25	—	.25	—	—
Aramite.....	1	1	—	—	1	1	—	—	—	1	—	1	—	1	—	—	—	—
Basic copper carbonate (post harvest applic., ppm combined copper).....	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
BHC.....	.5	.5	.5	5	5	5	5	5	—	5	—	5	5	5	—	5	—	—
Captan.....	20	20	20	20	20	20	20	20	—	20	—	20	20	20	—	20	—	—
Calcium arsenate (ppm combined As ₂ O ₃).....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.5	3.5
Chlordane.....	.3	.3	.3	.3	.3	.3	.3	.3	—	.3	—	.3	.3	.3	—	.3	.3	.3
Chlorobenzilate.....	5	5	—	—	—	—	—	—	—	—	—	5	—	5	—	—	—	—
DDT.....	7	7	7	7	7	7	7	7	—	7	—	7	7	7	—	7	7	7
2,4-D acid.....	5	5	5	—	—	—	—	—	—	5	—	5	5	5	—	5	—	—
Dicyclohexylamine salt of dinitro-O-cyclohexylphenol.....	1	1	1	1	1	1	1	1	—	1	—	1	1	1	—	1	1	1
Dieldrin.....	.25	.25	.25	.25	.1	.1	.1	.1	—	.25	—	.25	.25	.25	—	.25	—	—
Diethyldiphenyldichloroethane.....	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dinitro-O-cyclohexylphenol.....	—	—	—	—	—	—	—	—	—	1	—	1	1	1	—	1	—	—
Diphenyl.....	—	—	—	—	—	—	—	—	—	110	—	110	—	110	—	—	—	—
EPN.....	3	3	3	3	3	3	3	3	—	3	—	3	3	3	—	3	3	3
Ferbam.....	7	7	7	7	7	7	7	7	—	—	—	—	—	—	—	—	7	7
Fluorine compounds (ppm combined fluorine).....	7	7	7	—	7	7	7	7	—	7	—	7	7	7	—	7	7	7
Glyodin.....	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—
2-Heptadecylglyoxalidine.....	5	5	5	5	—	—	—	—	—	—	—	—	—	—	—	—	5	5
Lead arsenate (ppm combined lead).....	7	7	7	7	7	7	7	7	—	1	—	1	1	1	—	1	7	7
Lindane.....	10	10	10	10	10	10	10	10	—	10	—	10	10	10	—	10	—	—
Malathion.....	8	8	—	8	8	8	8	—	—	8	8	8	8	8	8	8	—	—
Maneb.....	7	—	—	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—
Methoxychlor.....	14	14	14	14	14	14	14	14	—	—	—	—	—	—	—	—	14	14
Methyl bromide (as fumigant, calculated as Br).....	5	5	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Monuron.....	—	—	—	—	—	—	—	—	1	1	1	1	1	1	1	1	—	—
Napthaleneacetic acid.....	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nicotine-containing comps. (ppm nicotine).....	2	2	2	2	2	2	2	2	—	2	—	2	2	2	—	2	2	2
Ovex (Ovatan).....	3	3	—	—	3	3	—	—	—	5	—	5	—	5	—	5	—	—

FRUIT (continued)

	POME		DRUPE						CITRUS									
	Apples	Pears	Quinces	Cherries	Plums (fresh prunes)	Peaches	Apricots	Nectarines	Citrus Citron	Grapefruit	Kumquats	Lemons	Limes	Oranges	Tangelos	Tangerines	Blackberries	Boysenberries
Parathion	1	1	1	1	1	1	1	1	—	1	—	1	1	1	—	1	1	1
Phenothiazine	7	7	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sodium-O-phenylphenate	5	5	—	—	—	—	—	—	10	10	10	10	10	10	10	10	—	—
Sulphenone	8	8	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—
Systox . . . . .	.75	.75	—	—	—	—	—	—	—	.75	—	.75	—	.75	—	—	—	—
Tarter emetic (ppm combined antimony trioxide)	—	—	—	—	—	—	—	—	—	3.5	—	3.5	3.5	3.5	—	3.5	—	—
TDE (DDD)	7	7	7	7	7	7	7	7	—	7	—	7	7	7	—	7	7	7
Thiram	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toxaphene	7	7	7	—	—	7	7	7	—	7	—	7	7	7	—	7	7	7
Zineb	7	7	7	7	7	7	7	7	—	7	—	7	7	7	—	7	7	7
Ziram	7	7	7	7	—	7	7	7	—	—	—	—	—	—	—	—	7	7

	BERRIES										SUB-TROPICAL							
	Dewberries	Loganberries	Raspberries	Blueberries	Currants	Gooseberries	Cranberries	Strawberries	Avocados	Papayas	Mangoes	Dates	Figs	Guavas	Passion Fruit	Pineapples	Grapes	Rhubarb
Aldrin	—	—	—	.1	—	—	.1	.1	—	—	.1	—	—	—	—	.1	.1	—
Aramite	—	—	1	1	—	—	—	1	—	—	—	—	—	—	—	—	1	—
BHC	—	—	—	—	—	—	—	5	5	—	5	—	—	5	—	5	5	—
Calcium arsenate (ppm combined As ₂ O ₃)	3.5	3.5	3.5	3.5	—	—	—	3.5	—	—	—	—	—	—	—	—	—	—
Captan	—	—	—	—	—	—	—	20	—	—	20	—	—	—	—	20	20	—
Chlordane .....	.3	.3	.3	.3	—	—	—	.3	—	.3	—	—	—	—	—	.3	.3	—
DDT	7	7	7	7	7	7	7	7	7	7	7	—	—	7	—	7	7	7
Dicyclohexylamine salt of dinitro-O-cyclohexylphenol. . .	1	1	1	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—
Dieldrin	—	—	—	—	—	—	.1	.1	—	—	.1	—	—	—	—	.25	.1	—
Diuron	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
EPN	3	3	3	—	—	—	—	3	—	—	—	—	—	—	—	3	3	—
Ethylene dibromide (soil treatment; calc. as Br)	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—
Ferbam	7	7	7	7	7	7	7	7	—	7	7	7	—	7	—	—	7	—
Fluorine compounds (ppm combined fluorine)	7	7	7	7	—	—	7	7	—	—	—	—	—	—	—	—	7	—
2-Heptadecyl glyoxalidine	5	5	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

FRUIT (continued)

	BERRIES										SUB-TROPICAL								
	Dewberries	Loganberries	Raspberries	Blueberries	Currants	Gooseberries	Cranberries	Strawberries	Avocados	Papayas	Mangoes	Dates	Figs	Guavas	Passion Fruit	Pineapples	Grapes	Rhubarb	
Lead arsenate (ppm combined lead).....	7	7	7	7	7	7	7	7	7	—	7	—	—	—	—	—	7	—	
Lindane.....	—	—	—	—	—	—	—	10	10	—	10	—	—	10	—	10	10	—	
Malathion.....	—	—	—	8	—	—	8	8	8	—	8	8	—	—	8	8	8	—	
Maneb.....	—	—	—	—	—	—	7	—	—	—	—	—	7	—	—	—	7	—	
Monuron.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	
Methoxychlor.....	14	14	14	14	14	14	14	14	—	—	—	—	—	—	—	14	14	—	
Nicotine-containing comps. (ppm nicotine).....	2	2	2	—	2	2	2	2	2	—	—	—	—	—	—	—	2	—	
Parathion.....	1	1	1	1	1	1	1	1	1	—	1	1	1	1	—	1	1	—	
SES.....	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	
Sodium arsenate (ppm combined As ₂ O ₃).....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.5	—	
Systox.....	—	—	—	—	—	—	—	.75	—	—	—	—	—	—	—	—	1.25	—	
Tarter emetic (ppm combined antimony trioxide).....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.5	—	
TDE (DDD).....	7	7	7	7	—	—	—	7	—	—	—	—	—	—	—	—	7	—	
Toxaphene.....	7	7	7	—	—	—	7	7	—	—	—	—	—	—	—	—	—	—	
Zineb.....	7	7	7	—	7	7	7	7	—	—	—	—	—	7	—	—	7	—	
Ziram.....	7	7	7	7	—	7	7	7	—	—	—	—	—	—	—	—	7	—	

MEAT

3 ppm methoxychor on fat of meat from cattle, sheep or hogs
7 ppm chlortetracycline on poultry (uncooked)

(from page 45) corn, oats, popcorn, rice, rye, sorghum and wheat.

Copper compounds. Bordeaux mixture, copper acetate, basic copper carbonate (malachite), copper-lime mixtures, copper oxychloride, copper silicate, copper sulfate basic, copper-zinc chromate and cuprous oxide.

Ethylene dibromide and ethylene dichloride, organic bromide residues. Exempt when used as fumigant for barley, corn, oats, popcorn, rice, rye, sorghum and wheat.

N-Ocytylbicyclo-(2,2,1)-5-heptane-2,3-dicarboximide

Petroleum oils

Piperonyl butoxide

Piperonylcyclonene

N-Propyl isome

Pyrethrum and pyrethrins

Rotenone or derris or cube roots

Ryania

Sabadilla

Zero Tolerances

These substances should not be used under conditions that will leave any toxic residues from them on fruits or vegetables as prepared for market:

Calcium cyanide

Dinitro-O-sec, butylphenol

Dinitro-O-cresol

Hexaethyl tetraphosphate

Mercury—containing compounds

Hydrocyanic acid

Selenium and selenium compounds

Tetraethyl pyrophosphate.

See the accompanying tables for other zero tolerances established under the Miller amendment. Those listed above are from the 1950 hearings.

VEGETABLES

	LEGUMES										TUBERS			SOLONACEOUS		
	Beans	Beans, dried	Green Beans	Snap Beans	[Lima Beans	Blackeyed Peas	Peas	Peas, dried	Cowpeas	Soybeans	Artichoke	Potatoes	Sweet Potatoes	Tomatoes	Eggplants	Peppers Pimientos
Aldrin	0.0	—	—	—	—	0.0	0.0	—	0.0	0.0	—	.1	.1	.1	.1	.1
Aramite	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—
BHC	5	—	5	5	5	5	5	—	—	—	—	—	—	5	5	5
Calcium arsenate	3.5	—	3.5	3.5	3.5	3.5	—	(ppm combined As ₂ O ₃)				—	—	3.5	3.5	3.5
Captan	—	—	—	—	—	—	—	—	—	—	—	—	—	20	20	20
Chlordane . . . . .	.3	—	.3	.3	.3	.3	.3	—	—	—	—	.3	.3	.3	.3	.3
Copper arsenate	—	—	—	—	—	—	—	—	—	—	—	—	—	3.5	—	—
DDT	7	—	7	7	7	7	7	—	—	—	7	—	7	7	7	7
Dicyclohexylamine salt of dinitro-O-cyclohexylphenol	1	—	1	1	1	1	—	—	—	—	—	—	—	—	—	—
Dieldrin	0.0	—	—	—	—	0.0	0.0	—	0.0	0.0	—	.1	.1	.1	.1	.1
Diuron	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Endrin	—	—	—	—	—	—	—	—	—	—	—	0.0	—	0.0	0.0	0.0
EPN	3	—	3	3	3	3	—	—	—	—	—	—	—	3	—	—
Ethylene dibromide	—	—	—	—	5	—	(soil treatment; calculated as Br)					—	50	—	—	—
Ferbam	7	—	7	7	7	7	7	—	—	—	—	—	—	7	7	7
Fluorine compounds	7	—	7	7	7	7	7	—	(ppm combined fluorine)			—	—	7	7	7
Heptachlor	—	—	—	—	—	—	—	—	—	—	—	.1	.1	—	—	—
Hydrogen cyanide	—	25	(post harvest fumigation)					25	—	—	—	—	—	—	—	—
Lead arsenate (ppm combined lead) . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	7	7	7
Lindane	10	—	10	10	10	10	10	—	—	—	—	—	—	10	10	10
Magnesium arsenate	3.5	—	3.5	3.5	3.5	3.5	(ppm combined As ₂ O ₃)				—	—	—	—	—	
Malathion	8	—	—	—	—	—	8	—	—	—	—	8	—	8	8	8
Maneb	7	—	—	—	—	—	—	—	—	—	—	—	—	7	7	7
Methoxychlor	14	—	14	14	14	14	14	—	100	—	—	—	—	14	14	14
Methyl bromide	50	—	50	50	50	50	(as fumigant; calculated as Br)				75	75	20	20	—	
Nicotine-containing comps.	2	—	2	2	2	2	2	(ppm nicotine)			2	—	—	2	2	2
Parathion	1	—	1	1	1	1	1	—	—	—	1	—	—	1	1	1
Phygon	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—
SES	—	—	—	—	—	—	—	—	—	—	—	6	—	—	—	—
Systox . . . . .	.3	—	.3	.3	.3	.3	—	—	—	—	—	.75	—	—	—	—
TDE (DDD)	7	—	7	7	7	7	7	—	—	—	—	—	—	7	7	7
Toxaphene	7	—	7	7	7	7	7	—	—	—	—	—	—	7	7	7
Zineb	7	—	7	7	7	7	7	—	—	—	—	—	—	7	7	7
Ziram	7	—	7	7	7	7	7	—	—	—	—	—	—	7	7	7

VEGETABLES (continued)

	ROOTS													
	Beets (garden) (with or without tops or beet-greens alone)	Beets (garden) roots	Sugar beets and tops	Sugar beets, no tops	Carrots (with or without tops; or carrot tops)	Carrots	Horse radish	Parsnips, roots only	Parsnips (with or without tops, or greens alone)	Radishes	Radishes (with or without tops or radish tops)	Rutabagas (with or without tops or tops alone)	Rutabagas, without tops	Rutabagas
Aldrin	.25	—	.1	—	—	.1	.1	.1	—	.1	—	—	—	.25
Calcium arsenate (ppm combined As_2O_3)	—	—	—	—	3.5	—	—	—	—	—	—	3.5	—	—
Chlordane	.3	—	—	—	.3	—	—	—	—	—	.3	.3	—	—
Copper arsenate (ppm combined As_2O_3)	—	—	—	—	3.5	—	—	—	—	—	—	—	—	—
DDT	7	—	—	—	7	—	—	—	7	—	7	7	—	—
Dieldrin	.25	—	—	—	—	.1	.1	.1	—	.1	.1	—	—	.25
Endrin	—	—	0.0	—	—	—	—	—	—	—	—	—	—	—
EPN	3	—	—	3	—	—	—	—	—	—	—	3	—	—
Ethylene dibromide (soil treatment, calc. as Br)	—	—	—	—	75	—	—	75	—	—	—	—	—	—
Ferbam	7	—	—	—	7	—	—	—	—	—	7	7	—	—
Fluorine compounds (ppm combined fluorine)	7	—	—	—	7	—	—	—	—	—	7	7	—	—
Heptachlor	—	.1	—	.1	—	.1	—	—	—	.1	—	—	.1	—
Malathion	8	—	—	—	—	—	—	—	—	—	—	—	8	8
Maneb	—	—	—	—	7	—	—	—	—	—	—	—	—	—
Methoxychlor	14	—	—	—	14	—	—	—	—	—	14	14	—	—
Methyl bromide (as fumigant, calculated as Br)	—	30	—	—	—	—	—	—	—	—	—	—	30	—
Nicotine-containing comps. (ppm nicotine)	2	—	—	—	—	—	—	—	2	—	2	2	—	—
Parathion	1	—	—	—	1	—	—	—	1	—	1	1	—	—
TDE (DDD)	—	—	—	—	7	—	—	—	—	—	7	7	—	—
Toxaphene	—	—	—	—	7	—	7	7	—	—	7	—	—	7
Zineb	7	—	—	—	7	—	—	—	—	—	7	7	—	7
Ziram	7	—	—	—	7	—	—	—	—	—	7	7	—	—

VEGETABLES (continued)

	ROOTS		COLE							VINE						
	Tumips, medium (with or without tops, or turnip greens)	Tumips, with tops	Tumips	Broccoli	Brussels Sprouts	Cabbage	Cauliflower	Kohlrabi	Melons	Cantaloupes	Muskmelons	Watermelons	Pumpkins	Squash, Winter	Cucumbers	Squash, Summer
Aldrin.....	.25	—	.25	.25	.25	.25	.25	.25	—	.1	.1	.1	.1	.1	.25	.25
Aramite.....	—	—	—	—	—	—	—	—	—	1	1	1	—	—	1	—
BHC.....	—	—	—	5	5	5	5	5	5	5	5	5	5	5	5	5
Calcium arsenate (ppm combined As ₂ O ₃).....	3.5	—	—	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Captan.....	—	—	—	—	—	—	—	—	—	20	—	20	20	20	20	20
Chlordane.....	.3	—	—	.3	.3	.3	.3	.3	.3	.3	.3	.3	—	.3	.3	.3
Chlorobenzilate.....	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—
Copper arsenate (ppm combined As ₂ O ₃).....	—	—	—	—	3.5	3.5	3.5	3.5	—	—	—	—	—	—	—	—
DDT.....	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7
Dieldrin.....	—	—	.25	.25	.25	.25	.25	.25	—	0	0	0	0	0	.25	.25
Endrin.....	—	—	—	—	—	0	—	—	—	—	—	—	—	—	0	0
EPN.....	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (soil treatment; calculated as Br).....	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—	—
Ferbam.....	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7
Fluorine compounds (ppm combined fluorine)...	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7
Heptachlor.....	—	.1	—	—	.1	.1	.1	.1	—	—	—	—	—	—	—	—
Lindane.....	—	—	—	10	10	10	10	10	10	10	10	10	10	10	10	10
Malathion.....	—	8	—	8	8	8	8	—	8	8	8	8	—	8	8	8
Maneb.....	—	—	—	—	—	—	—	—	7	7	7	7	—	7	7	7
Methoxychlor.....	14	—	—	14	14	14	14	14	14	14	14	14	14	14	14	14
Methyl bromide (as fumigant, calculated as Br).....	—	—	30	—	—	—	—	—	—	—	—	—	—	—	—	—
Nicotine-containing comps. (ppm nicotine)....	2	—	—	2	2	2	2	2	2	2	2	2	2	2	2	2
Parathion.....	1	—	—	1	1	1	1	1	1	1	1	1	1	.1	1	1
Systox.....	—	—	—	.75	.75	.75	.75	—	—	—	.75	—	—	—	—	—
TDE (DDD).....	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7
Toxaphene.....	—	—	—	7	7	7	7	7	—	—	—	—	—	—	7	—
Zineb.....	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7
Ziram.....	7	—	—	7	7	7	7	7	7	7	7	7	7	7	7	7

VEGETABLES (continued)

	LEAFY							SALAD	ONION						
	Collards	Mustard Greens	Parsley	Kale	Spinach	Swiss Chard	Turnip Tops	Lettuce	Endive & Escarole	Salsify Tops	Onions, inc. green	Onions, Dry bulb	Garlic	Leeks	Shallots
Aldrin.....	.25	.25	.25	—	.25	.25	.25	.25	.25	.25	.25	—	.25	.25	.25
BHC.....	5	5	5	—	5	5	—	5	—	—	5	—	—	—	—
Calcium arsenate (ppm combined As ₂ O ₃).....	3.5	3.5	—	—	3.5	—	—	—	—	—	—	—	—	—	—
Chlordane.....	.3	.3	—	—	—	—	—	.3	—	—	.3	—	—	—	—
DDT.....	7	7	7	—	7	7	—	7	7	—	7	—	—	—	—
Dieldrin.....	.25	.25	.25	—	.25	.25	.25	.25	.25	.25	.1	—	—	—	—
Diphenyl.....	—	—	—	—	110	—	—	110	—	—	—	—	—	—	—
EPN.....	—	—	—	—	3	—	—	3	—	—	—	—	—	—	—
Ferbam.....	7	7	7	—	7	—	—	7	—	—	7	—	—	—	—
Fluorine compounds (ppm combined fluorine).....	7	7	7	—	—	—	—	7	—	—	—	—	—	—	—
Heptachlor.....	—	—	—	—	—	—	—	—	—	—	.1	—	—	—	—
Lindane.....	10	10	10	—	10	10	—	10	—	—	10	—	—	—	—
Malathion.....	—	8	8	—	8	—	—	8	—	—	8	—	—	—	—
Maneb.....	—	—	—	—	7	—	—	—	—	—	7	—	—	—	—
Methyl bromide (as fumigant, calculated as Br)....	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—
Methoxychlor.....	14	14	—	—	14	—	—	14	—	—	—	—	—	—	—
Monuron.....	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—
Nicotine-containing comps. (ppm nicotine).....	2	2	2	2	2	2	—	2	—	—	2	—	—	—	—
Parathion.....	1	1	1	—	1	1	—	1	1	—	1	—	—	—	—
Systox.....	—	—	—	—	—	—	—	.75	—	—	—	—	—	—	—
Tarter emetic (ppm combined antimony trioxide)...	—	—	—	—	—	—	—	—	—	—	3.5	—	—	—	—
TDE (DDD).....	—	—	—	—	7	7	—	7	—	—	—	—	—	—	—
Toxaphene.....	—	—	—	—	—	—	—	7	—	—	7	—	—	—	—
Zineb.....	7	7	7	7	7	7	—	7	7	—	7	—	—	—	—
Ziram.....	7	7	—	—	7	—	—	7	—	—	7	—	—	—	—

VEGETABLES (continued)

GRAIN

	CORN							OTHER									
	Com	Sweet Com, kernels but not forage	Com, inc. pop com	Com Grain, inc. pop com	Asparagus	Celery	Mushrooms	Okra	Peanuts	Barley	Buckwheat	Oats	Rice	Rye	Wheat	Oats, Barley, Rice, Wheat each in grain form	Sorghum grain
Aldrin.....	—	—	—	0	.1	.1	—	—	.25	—	—	—	—	—	—	.1	—
Aramite.....	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
BHC.....	5	—	—	—	5	5	—	5	—	—	—	—	—	—	—	—	—
Calcium arsenate (ppm combined As ₂ O ₃)...	3.5	—	—	—	3.5	3.5	—	—	—	—	—	—	—	—	—	—	—
Calcium cyanide.....	25	—	—	—	—	—	—	—	—	25	25	25	25	25	25	—	25
Chlordane.....	.3	—	—	—	—	.3	—	.3	.3	—	—	—	—	—	—	—	—
DDT.....	7	—	—	—	7	7	7	7	7	—	—	—	—	—	—	—	—
Dicyclohexylamine salt of dinitro-O-cyclohexylphenol.....	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Dieldrin.....	—	—	—	0	.1	.25	—	—	—	—	—	—	—	—	—	.1	—
EPN.....	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene dibromide (fumigant, calculated as Br).....	—	—	50	—	—	—	—	—	—	50	—	50	50	50	50	—	—
Ethylene dibromide (soil treatment, calculated as Br).....	—	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—
Ferbam.....	7	—	—	—	7	7	—	—	7	—	—	—	—	—	—	—	—
Fluorine compounds (ppm combined fluorine).....	7	—	—	—	—	—	—	7	7	—	—	—	—	—	—	—	—
Heptachlor.....	.1	—	—	—	—	—	—	—	.1	—	—	—	—	—	—	—	—
Hydrogen cyanide (post harvest fumigation).....	—	—	25	—	—	—	—	—	25	25	—	—	25	25	25	—	—
Lead arsenate (ppm combined As ₂ O ₃).....	—	—	—	—	7	7	—	—	—	—	—	—	—	—	—	—	—
Lindane.....	10	—	—	—	10	10	10	10	—	—	—	—	—	—	—	—	—
Malathion.....	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—
Maneb.....	—	—	—	—	—	7	—	—	—	—	—	—	—	—	—	—	—
Methoxychlor.....	14	—	—	—	14	—	14	—	14	2	—	2	2	2	2	2	2
Methyl bromide (as fumigant, calculated as Br).....	50	—	—	—	—	—	—	—	—	50	—	50	50	50	50	—	—
Monuron.....	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Nicotine-containing comps. (ppm nicotine).....	2	—	—	—	2	2	2	2	—	—	—	—	—	—	—	—	—
Parathion.....	1	—	—	—	—	1	—	1	1	1	—	1	—	—	1	—	—
Phygon.....	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—
Piperonyl butoxide (post harvest fumigation).....	—	—	20	—	—	—	—	—	—	20	20	—	20	20	20	—	—
Pyrethrins (post harvest fumigation).....	—	—	3	—	—	—	—	—	—	3	3	—	3	3	3	—	—
SES.....	—	—	—	—	2	—	—	—	6	—	—	—	—	—	—	—	—
TDE (DDD).....	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Toxaphene.....	7	—	—	—	—	7	—	7	7	—	—	—	—	—	—	—	—
Zineb.....	7	—	—	—	—	7	7	—	7	—	—	—	—	—	1	—	—
Ziram.....	—	—	—	—	—	7	—	—	7	—	—	—	—	—	—	—	—

GRAIN (continued)

HAY & FORAGE

	Grain Sorghum (Milo)	Grain Sorghum	Alfalfa	Clover, inc. sweet clover	Lespedeza	Peanut hay	Pea hay	Cowpea hay	Soybean hay	Vetch	Alfalfa hay	Peanut hulls and hay	Corn Forage	Grain Sorghum Forage	Pea Forage	Peanut Forage	Soybeans (whole plant)
Aldrin	—	0	0	0	0	0	0	0	0	—	—	—	0	0	—	—	—
Aramite	—	—	0	—	—	—	—	—	—	—	—	—	—	—	—	—	0
Dieldrin	—	0	0	0	0	0	—	0	0	—	—	—	0	0	—	—	—
Ethylene dibromide	50	(fumigant, calculated as Br)		—	—	—	—	—	—	—	—	—	—	—	—	—	—
Heptachlor	—	—	.1	.1	—	—	—	—	—	—	—	—	—	—	—	—	—
Malathion	—	—	8	8	—	—	—	—	—	—	—	—	—	—	—	—	—
Methoxychlor	—	2	100	100	—	—	—	—	—	—	—	—	—	—	—	100	—
Methyl bromide	50	(as fumigant, calculated as Br)		—	—	—	—	—	—	—	50	—	—	—	—	—	—
Parathion	—	—	1	1	—	—	—	—	—	1	—	—	1	—	1	—	—
SES	—	—	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—

HAY & FORAGE (continued)

NUTS

OTHER

	Soybean forage	Grass—pasture and range	Grass—for forage Oat, Rice, Barley, Rye, Wheat, each in straw form	Almonds	Almond hulls	Cashews	Hazelnuts	Hickory nuts	Pecans	Walnuts	Cocoa Beans	Cotton	Cotton seed	Hops	Olives	Sugar cane
Aldrin	—	—	.75	—	—	—	—	—	—	—	—	—	—	—	—	—
Aramite	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dieldrin	—	—	.75	—	—	—	—	—	—	—	—	—	—	—	—	—
Diuron	—	—	—	—	—	—	—	—	—	—	—	—	.1	—	—	1
Endrin	—	—	—	—	—	—	—	—	—	—	—	—	0	—	—	—
EPN	—	—	—	.5	—	—	—	—	.5	.5	—	—	.5	—	3	—
Ethylene dibromide	—	(soil treatment, calculated as Br)		—	—	—	—	—	—	—	—	—	25	—	—	—
Ferbam (calculated as zinc)	—	—	.1	—	—	—	—	—	—	—	—	—	—	—	—	—
Heptachlor	—	.1	—	—	—	—	—	—	—	—	—	.1	—	—	—	.1
Hydrogen cyanide	—	(post-harvest fumigation)		25	—	25	—	—	25	25	25	—	—	—	—	—
Maneb	—	—	.1	—	—	—	—	—	—	—	—	—	—	—	—	—
Methyl bromide	—	(as fumigant, calculated as Br)		—	—	—	—	—	—	—	50	—	200	—	—	—
Methoxychlor	100	—	100	—	—	—	—	—	—	—	—	—	—	—	—	—
Monuron	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
Parathion	—	—	1	—	—	—	—	—	—	—	—	—	—	1	1	—
Systox	—	—	.75	5	—	—	—	.75	.75	—	—	—	—	—	—	—
Toxaphene	—	—	—	—	—	7	7	7	7	—	—	—	—	—	—	—
Zineb	—	—	—	—	—	—	—	—	—	—	—	—	—	60	—	—
Ziram	—	—	.1	—	—	—	—	—	.1	—	—	—	—	—	—	—

Fertilizer Materials Market

New York

August 12, 1956

Sulfate of Ammonia. A better movement was noted due to the steel strike and lack of coke oven production. However, with the end of the steel strike the supply situation should improve considerably. No price changes were noted.

Ammonium Nitrate. TVA recently brought the price of their material in line with other domestic producers which amounts to a reduction in price.

Urea. Buyers are taking a limited amount of this material for fertilizer on contract but industrial buyers are calling for larger quantities.

Nitrogenous Tankage. This market at present has a price range of from \$3 to \$4 per unit of ammonia (\$3.64 to \$4.86 per unit N), f.o.b. production points. A few scattered sales were made for prompt shipment.

Castor Pomace. Sales were made at \$35 per ton, f.o.b. production points and supply is still limited.

Organics. Trading in most organic materials was on the slow side with most buyers on the sidelines awaiting further developments. Tankage sold at \$4.75 per unit of ammonia (\$5.77½ per unit N), and blood at \$5.00 per unit of ammonia (\$6.08 per unit N), both f.o.b. Eastern production points. Soybean meal was available for prompt shipment, guaranteed 44 per cent protein in bulk at \$52.50 per ton, f.o.b. Decatur, Ill. Cottonseed meal was fairly tight for prompt shipment and hard to locate as most of the old crop material has already been sold. Linseed meal was steady in price.

Fish Meal. While reports of poor fishing were current due to

unfavorable weather conditions, the demand remained limited and few sales were made. Fish meal was available at about \$130 per ton f.o.b. fish factories for prompt shipment. Very little foreign material was offered.

Bone Meal. A slightly better demand was noted for this material and last sales were made on the basis of \$55 per ton, f.o.b. production points with very little imported material arriving. This price has been asked for both the fertilizer and feed grades.

Hoof Meal. Demand limited at the present time and last sales were made on the basis of \$6.25 per unit of ammonia (\$7.59½ per unit N), f.o.b. Chicago. The demand has been coming mostly from industrial buyers.

Superphosphate. With recent increases in the price of phosphate rock there was some question as to whether producers of this material would hold the line on prices or raise them. So far no price increases have been reported. Triple superphosphate was reported moving in good volume.

Potash. Some imported muriate and sulfate of potash has been sold at prices slightly under the domestic market, but it was reported that only a limited quantity was available. Sales of this material for future delivery were said to be under last year.

Philadelphia

August 12, 1956

The market remains quite inactive, with large stocks on hand. And in some instances complete mixtures are being carried over from the Spring. Fish scrap is presently stronger, but packing-house by-products are very quiet. Superphosphate supplies are large

and potash movement is disappointing.

Sulfate of Ammonia. The demand recently showed slight improvement, due in part to the steel strike and fair export inquiry. Stocks, however, continue more than ample. Production during first half of this year was greater than same period in 1955.

Nitrate of Ammonia. Market is very quiet, with supply plentiful.

Nitrate of Soda. Prices remain unchanged, with moderate movement and ample supply.

Urea. Market is strong in spite of increased production, although the strongest inquiry comes from the industrial trade.

Blood, Tankage, Bone. Market is quiet with blood priced at \$5 per unit ammonia (\$6.08 per unit N) per ton in New York area, and \$5.25 (\$6.38 per unit N), Chicago. Tankage is quoted \$4.75 per unit (\$5.77½ per unit N), New York and \$5.25 (\$6.38 per unit N), Chicago. Bone meal is weak at \$55 per ton.

Castor Pomace. This continues to be listed at \$35 per ton with trading limited.

Fish Scrap. This took a recent jump of five dollars per ton due to slack fishing operations. Menhaden meal is priced at \$133 per ton and scrap at \$129.

Phosphate Rock. Slightly increased prices are reported now in effect, and production is being eased somewhat to match demand.

Superphosphate. Demand is said to be about normal, but behind production.

Potash. Movement is fair and prices without change. It is reported that potash imports will be greatly increased, which might presage some price change in the near future. ▲

Equipment & Supplies

Bristol Telemetering Instrument System

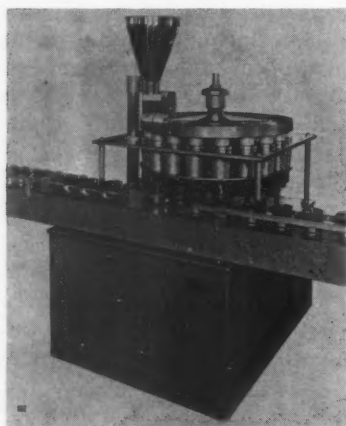
Bristol Co. is marketing a new system of telemetering instruments to totalize several flow measurements, correct for such factors as temperature, pressure, specific gravity and supercompressibility in fluids, and to provide a corrected flow value.

The computing systems are built up to fit a specific set of requirements from standard Bristol Metameter measuring transmitters. In a typical system, indicating or recording telemeter receivers retransmit the uncorrected flow values to a totalizing electronic instrument; then corrections for static pressure, temperature and specific gravity are made and the corrected total is recorded and integrated if desired. For more details

Circle 307 on Service Card

WhizPacker Makes 300 Fills A Minute

Frazier & Son say their 18-Pocket High Speed Rotary WhizPacker Filling Machine speeds up to 300 accurate fillings per minute, even where product settling is



necessary for filling the container.

Utilizing a minimum of space, the machine is equipped with

"no can—no fill" automatic container control and offers positive filling without spillage, according to the firm.

Circle 308 on Service Card

Telescopic Conveyor From Richardson

Variable belt speeds and an adjustable frame to meet many conveying requirements are featured in Richardson Scale's new flat belt bag conveyor.

The conveyor frame is telescopic in design, constructed in two parts. The rear half can be telescoped over the front half for a minimum conveying length of 7 ft. Full length, with both sections fully extended, is 12 ft.

Standard conveyor equipment includes the frame, pulleys, speed reducer and belt, the latter complete with alligator fasteners, bearings and rear pulley takeup. Motor equipment, bag rest and a bag stop limit switch are optional.

For more information on the conveyor,

Circle 309 on Service Card

Fillmaster Unit For Difficult Packaging

The Fillmaster automatic filling machine provides high production in packaging difficult dry and semi-dry products, states its maker, Stuyvesant Engineering Co. The model has a double joined hopper, can fill two containers simultaneously and up to 300 a minute.

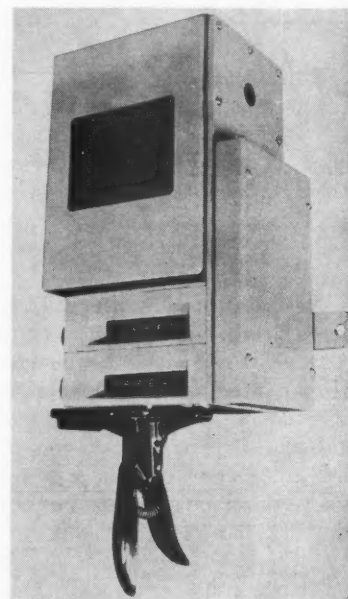
Vibratory action on each hopper is individually controlled so that the discharge of each mouth can be varied to provide uniform product weights.

The company will send you more details on the Fillmaster if you

Circle 310 on Service Card

Record Weighings With Remote Counter

A positive clutch drive permits Richardson Scale Co.'s remote electric counter to record up to 200 weighings per minute, the company reports.



With the counter the user can tabulate and record a weighing process from any point in his plant. It also can be used to keep production records as well as tabulate customers' orders.

Two models are available—model 31-42 records individual weighings and 31-41 records an accumulative total as well as individual weighings. For further data

Circle 311 on Service Card

'Clarklift Features' Booklet Available

Construction details, operating characteristics and maintenance features of the new Clarklift line of fork trucks are described in a 16-page, three-color brochure, "Clarklift Features," now available from Clark Equipment Co. Included are many photos and simplified drawings and a special section on Clark's new Hydrotork Drive. For a copy

Circle 312 on Service Card

FARM CHEMICALS

Nylon Valves For Aerosol Containers

Aerosol producers can use Seaquist Mfg. Corp.'s new nylon valve for literally hundreds of pressurized products, according to E. J. McKernan, sales manager. Resistant to corrosive products because of its nylon construction, it is said to work equally well with non-corrosive chemicals.

A sealing and retaining ring holds the pressure button firmly on the stem to eliminate possible lost buttons and to prevent seepage between stem and button. There are three controllable orifices for any desired density of spray, the manufacturer reports.

For more information
Circle 313 on Service Card

Flow Computers

Librascope Flow Computers, pressure compensated totalizing devices for orifice measurements of fluids, will be distributed by Barton Instrument Corp. Librascope, Inc., announces.

Hand integration of chart records is said to be reduced or completely eliminated by the computer, providing greater accuracy and remote control transmission.

For further details
Circle 314 on Service Card

St. Regis Cites Merits Of New Pallet Bag

A squared-off package for better palletizing and improved appearance is now possible with the new "pallet bag", according to St. Regis Paper Co.

Length of the pasted bag is shortened for improved pallet loading and size of the gussets is increased. A small sleeve and large valve prevent siftage even though the width of the gussets is greater. The firm says that the possibility of slippage of the pallet load is reduced.

For more information
Circle 315 on Service Card

CLASSIFIED ADVERTISING

NEW RATES . . .

Help wanted, positions wanted, used machinery and business opportunities are now charged at only 10 cents per word, \$2.00 minimum. Count box number as five words.

Display ads . . . \$15.00 per column inch, minimum of one

inch. Ads over the minimum are accepted only in multiples of one half inch.

For prompt results, send your classified ads to Farm Chemicals, 317 N. Broad St., Philadelphia 7, Pa.

Closing date: 10th of preceding month

FOR SALE

Surplus Fertilizer Mixing and Handling Equipment for Sale:

Complete list of machinery available at Berkeley and Los Angeles plants will be sent on request to:
Pacific Guano Company
1832 Second Street
Berkeley 10, Calif.
Telephone: THornwall 5-7120
TWX: OA 430

BUSINESS OPPORTUNITIES

INTERESTED—Purchasing or merging with small fertilizer plant in No. Florida area. Profit record not important. Address "550" care FARM CHEMICALS, Philadelphia 7.

Suppliers' Briefs

Clark Equipment Co. has received Underwriters' Laboratories listing for type "EE" construction of the Powrworker pallet truck, Powrworker platform truck and 12-volt Tugger towing tractor.

New dealers named to sell products of the Industrial Truck Div. include Black and Gaisser Co., Evansville, Ind.; Mahoney Equip. Co., Rapid City, S. D.; Valley Industrial Trucks, Inc., Youngstown, O.; and Madden Equip. Co., Houston, Tex.

Dorr-Oliver. The Field Engineering Div. has been expanded as a function of the new Sales Services Dept.

Fulton Bag & Cotton Mills has named Clarence E. Elsas executive vice president and head of the Textile Div.; Fred G. Barnett, vice president and general sales manager, Textile Div.; and J. F. Greene as general manager of textile manufacturing.

Laboratory Services

Projects, consultation and production control services in Biochemistry, Chemistry, Bacteriology, and Toxicology.
Insecticide Testing and Screening
Mineral Analyses including fluorine determination.
Write for price schedule

WISCONSIN ALUMNI RESEARCH FOUNDATION

P. O. Box 2217-CC
Madison 1, Wisconsin

WISCONSIN ALUMNI RESEARCH FOUNDATION

Kraft Bag Corp. Joseph J. McDermott has joined the sales staff to represent the company in Metropolitan Chicago, northern Illinois and in Michigan, operating out of the Chicago office.

Sprout, Waldron & Co. A new office addition recently was opened at Muncy, Pa.

Universal Hoist & Mfg. Co. recently celebrated its 50th anniversary. Honored guest at the party commemorating the event was company president John Voorhees, who founded the firm in 1906.

Chemicals

Antibiotic Cuts Loss From Stone-Blast

Two New Zealand scientists, D. W. and M. H. Dye of the Mount Albert fruit research station, Auckland have found streptomycin an effective antidote for stone-blast, a disease which attacks stone fruit, FERTILIZER AND FEEDING STUFFS JOURNAL recently reported.

Used in a spray, streptomycin has been found to cut average loss from stone-blast from about 15 per cent to not more than 2 per cent. The discovery was said to have created widespread interest among scientists in other countries.

Heptachlor Tested Against Boll Weevil

Experiment station tests conducted during the past three years indicate that granular heptachlor sharply reduces boll weevil infestations, according to Velsicol Chemical Corp. Experimenters in Louisiana and the Rio Grande valley report that single applications of 25 to 40 pounds of 2½ per cent heptachlor granules per acre early in the season held boll weevil infestations in check for periods up to two weeks. The tests indicate that granules applied on the soil surface kill weevils as they emerge from the fallen square, before they reach the cotton plant, meaning less stung squares and higher yields of cotton at lower cost.

Phosdrin Granted Experimental Label

Experimental label acceptance has been given Phosdrin by USDA for use against insects attacking certain fruit and vegetable crops, Shell Chemical Corp. reports.

An organic phosphate, Phosdrin invades a plant's system, and kills insects that either tap into the treated plant or come in contact

with the insecticides. Shell says that in field experiments the chemical has proved lethal to insects that have developed a tolerance for other insecticides.

One of its chief advantages, according to F. W. Hatch, Shell Chemical manager of agricultural chemical sales, is its rapid (one to three days) dissipation.

The firm plans to have the product available in limited quantities for summer and fall crops.

Conn. Researcher Reports on Systemics

Further progress in insect control on certain ornamental plants by systemic insecticides is reported by entomologist John C. Schread in a 20-page circular of the Connecticut AES. Titled "Systemic Insecticides to Control Mealybug, Scale, Aphids and Cyclamen Mite on Ornamentals," it gives results in controlling these pests with varying dilutions of Systox, Thimet, malathion, Endrin, Loro and compounds 12008 and G-22870.

The station reports that as supply permits, copies of the circular, number 200, are available without charge from Publications, The Connecticut Agricultural Experiment Station, Box 1106, New Haven 4, Conn.

New Growth Method For Tree Seedlings

A chemical treatment to speed the growth of tree seedlings has been developed at the Quebec City's Laval University Forest School.

Applying recent discoveries in hydroponics, the growth method is expected to be available for commercial exploitation in about a year.

Dr. Andre Lafond, research director of the Forestry School, said that work has shown seedlings can be chemically speeded in three or four months to a stage of growth usually reached after two years in a nursery.

'Stop-Drop' Sprays For Apples & Pears

Pre-harvest losses of apples and pears are being reduced from about 20 per cent to less than 6 per cent by plant growth regulators, USDA reports.

At present four compounds are commonly used by fruit growers as stop-drop sprays—NAA (naphthaleneacetic acid), 2,4-D (2,4-dichlorophenoxyacetic acid), 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) and 2,4,5-TP (2,4,5-trichlorophenoxypropionic acid).

NAA, the only material suitable for airplane spraying, retards drop of any commercial varieties of apples and pears, but usually is effective for 10 days or two weeks, said USDA. The three other compounds will hold fruit fast three to four weeks after application. Experiments by horticulturists of USDA's Agricultural Research Service show 2,4-D will effectively control the drop of Winesap and Stayman apples and Bartlett pears.

While 2,4,5-T and 2,4,5-TP are satisfactory for all commercial varieties of apples, pears or pear foliage may be damaged by their use.

Between 600 and 1,000 gallons of dilute spray, applied with conventional spraying equipment, is required to spray an acre of large fruit trees from the ground. Cost averages roughly \$4 per acre.

Mixture Doesn't Work on 'Hoppers

Iowa State College scientists have obtained evidence indicating it's not too good to mix insecticides and herbicides and apply them at the same time, especially where grasshopper control is involved. In most cases, the Iowa specialists say, the weed killers cause plants to curl and dry up in a few days, and grasshoppers move on to tastier fare.



PEST REPORTS

Borer Heavy in Some States

DURING late July and early August the European corn borer had been reported as causing extensive damage in several states with heavy second broods possible. In New Hampshire first brood of the borer was causing more damage than in 1955. Injury to tassels in many untreated fields of Massachusetts ranged from 70-90 per cent, and it was expected that any corn not picked by August 10 would be attacked by second-brood borers.

Damage in Rhode Island was reported as very heavy with infestations ranging from 18-35 per cent in sweet corn. A heavy and damaging second brood appeared likely. Heavy populations were reported in Rockland, Columbia and Monroe counties, New York, with pupation underway. Maryland, Delaware and Pennsylvania also reported heavy European corn borer damage.

Infestation of sweet corn in Frederick and Carroll counties, Maryland, ranged up to 90 per cent. Damage to field corn in Baltimore and Montgomery counties was reported as being moderate. Second-generation moths were appearing in early August in Maryland. Moths were emerging in early sweet corn in Ohio.

Cool weather in Illinois had slowed down development and caused abnormally high mortality in some areas, but damaging second-generation borers were expected in certain sections. In some northern and northeastern Illinois counties first-generation borers were two to four times as

heavy as in 1955 with second generation borers expected to be as bad as or worse than last year. Other northern Illinois counties expected about the same number or possibly fewer second-generation borers than in 1955. In Minnesota development of the borer was a week to 10 days ahead of 1955 with infestation ranging from 23 to 62 per cent. Second-brood moths appeared July 13 in Iowa, slightly ahead of 1955 appearance. Infestations in South Dakota were running to the lighter side. Counts late July in two Nebraska counties, Cuming and Hall, were 11 and 14 per cent respectively. In late July indications were that controls would be needed in late corn in the eastern area of Arkansas.

Spotted Alf. Aphid Continues to Spread

The spotted alfalfa aphid continues to be found in new areas with specimens of the insect having recently been collected in Kentucky, North and South Carolina and Virginia for the first time. All of the infestations were reported as light to moderate. The insect was on the build-up in several areas during late July and early August.

Increases with varying degrees of intensity were reported from California, Utah, Arizona, Colorado, Nebraska, Kansas, New Mexico, Louisiana, Arkansas and Missouri. In Georgia several additional counties were reported infested for the first time.

*Presented in cooperation with
the Economic Insect Survey
Section, Plant Pest Control
Branch, Agricultural Research
Service, USDA.*

Single Melon Fly Trapped in Calif.

A gravid female melon fly, (*Dacus cucurbitae*), a serious vegetable pest which sometimes attacks fruit, was taken in a trap on the UCLA Campus, Los Angeles, California, July 24, 1956. As of August 13 no more live specimens had been found, although an extensive survey was underway. The melon fly, taken in a trap that had been placed in the area in connection with the Mexican fruit fly survey, is not known to be established in this country.

The melon fly, closely related to the oriental fruit fly and the Mediterranean fruit fly, was first known in the Indo-Malayan region and is apparently the most important cucurbit pest there. It was introduced into Hawaii about 1895 where it has been a limiting factor in the production of melon, cucumber, tomatoes and pumpkin.

At one time the only practical way to produce host fruits in Hawaii was with the use of protective coverings such as soil, paper or cloth. This is still practiced but progress is being made with chemical controls. Research agencies have developed a malathion bait spray for control of the fly, but the habit of the fly tending to frequent plants in areas bordering the fields adds to the difficulty of control.

Upon discovery of the fly in Los Angeles the Plant Pest Control Branch, USDA and California authorities immediately initiated a survey program. Early in August 2,000 traps were in operation in the area of the find and additional ones were to be made available.

The Los Angeles County placed

restriction on movement of plant material from within five miles of the find and the state was preparing to take formal quarantine action. The extent of quarantine and control action will depend upon further finds.

Boll Weevil & Bollworm

During late July and early August cotton boll weevil populations continued to increase in most states. Irrigated cotton in Texas showed an increase in populations as did fields in western Tennessee that had received rain. Light increases were also reported from Louisiana, Mississippi and Georgia with heavier populations being noted in Alabama, North and South Carolina. Missouri continued light and a between brood decline was reported from Arkansas with a general and rapid rise in infestation expected.

The cotton bollworm was also on the increase in most of the

cotton producing states. Heavy populations of this insect were reported from Arizona, New Mexico, Texas, Oklahoma and Tennessee.

Spider mites by early August were beginning to be of concern in several states. Many fields in Missouri were being defoliated. Heavy local infestations were recorded from Arkansas, Mississippi, Georgia and North and South Carolina.

Colo. Potato Beetle

The Colorado potato beetle was reported in late July to be more abundant than normal in certain areas of Oregon. Heavy populations were also reported from Idaho and Delaware.

During this reporting period two cases of screw-worms were reported from Lancaster, South Carolina and one case from Fredericksburg, Virginia.

Bagworms were perhaps the

most important ornamental pests reported on during the period. In Indiana the infestation was the worst on record with evergreens, maple, willow, birch, apple, and wild cherry having been heavily infested. Missouri also reported the heaviest recorded infestation with wide range of plants and shrubs being attacked. Other states reporting heavy infestations included Delaware, Pennsylvania, Virginia, West Virginia, Maryland, Georgia, Florida, Mississippi, Oklahoma and Illinois.

The pepper maggot has been found infesting pimiento pepper in Hart County, Georgia. There is a good chance that the insect is damaging pimiento and possibly bell pepper in other areas of the State. Heavy damage has been done in some fields of three South Carolina counties near the Georgia line. In addition to South Carolina, infestations have been reported recently from Alabama and North Carolina. ▲

MONARCH SPRAYS



This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays now used by nearly all chamber spray sulphuric acid plants.

CATALOG 6-C

MONARCH MFG. WORKS, INC.

2501 East Ontario Street, Philadelphia, Pa.

SHUEY & COMPANY, Inc.

Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for Florida Hard Rock Phosphate Export Association. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemists for National Cottonseed Products Association.

115 E. BAYSTREET, SAVANNAH, GA.

Dictionary of Plant Foods 1955 Edition \$1.00 postpaid

The reference booklet or all who are interested in production and use of chemical fertilizers.

Farm Chemicals, 317 N. Broad St., Phila. 7, Pa.

ORGANIC FERTILIZER MATERIALS

CASTOR POMACE
BONEMEAL
COCOA SHELLS
TANKAGE

NITROGENOUS TANKAGE
SHEEP MANURE
DRIED COW MANURE
BLOOD

Send us your inquiries

FRANK R. JACKLE

405 LEXINGTON AVENUE

NEW YORK 17, N. Y.

BETTER MARKING EQUIPMENT by industrial

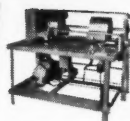
FOR PRODUCTION LINE
MARKING, DATING AND CODING

Industrial Marking Equipment is engineered to lower your costs — raise your operating standards. It is unmatched for high speed performance, and economical, efficient operation.

Before you make any decision on marking equipment, get full information on Industrial—you'll be glad you did!

Write for the new
Industrial catalog
—today. Dept. FC

multiwall
bags
pillowtype
packages
cartons
containers
drums
cases
shooks
pails
rolls
cans
etc.



No. 7 Autoprinters



Rainbow Transleaf
Coders



Whippet Conveyor
Line Markers



Multi-Wall Bag Printer

ime

INDUSTRIAL MARKING EQUIPMENT
454 BALTIC STREET | company, inc.
BROOKLYN 17, N.Y. | MAin 4-2601

FEEDING AND FERTILIZER MATERIALS

(SINCE 1898)

SAMUEL D. KEIM

1343 ARCH STREET
PHILADELPHIA 7, PA.

The
**TUMBLING
ACTION**
does it!

BLENDS FASTER...

MIXES BETTER...

AT LOWER COST

Only Munson gives you the exclusive Rotary Batch Mixer that tumbles... turns and folds dry ingredients... faster and better... without reducing the size of particles.

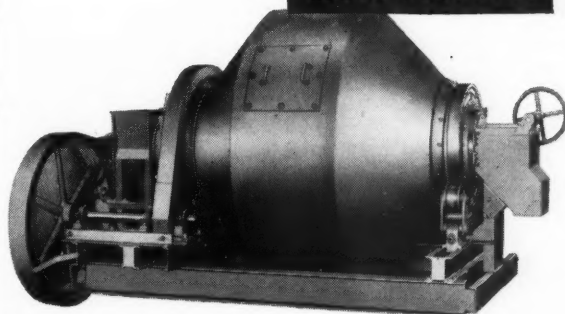
The Munson Mixer requires less horsepower, costs less to operate. Flexible design permits modification to meet your plant requirements.

Available in capacities from 20 to 250 cu. ft., the Munson Mixer is unequalled for dry mixing of chemicals, fertilizers, gelatin, antibiotics, insecticides, cereals, glue and other dry ingredients. Where a limited amount of liquid is required, the Munson can be fitted with an internal spray pipe.

Our engineers will be glad to help you solve your mixing problems.

Write today for full information to:
MUNSON MILL MACHINERY CO.
Dept. FC 956, UTICA, N. Y.

MUNSON
ROTARY BATCH MIXER



by Dr. Melvin Nord

PATENT REVIEWS

Process for Improving Amm. Nitrate Prills

US 2,739,036 issued March 20, 1956 to Joseph L. Kamenjar and Herbert R. Antle, assigned to Phillips Petroleum Co., describes a process for producing an ammonium nitrate prill of improved hardness, density and dryability.

In general, ammonium nitrate is produced by reacting ammonia with nitric acid to produce a solution of ammonium nitrate. This solution must be concentrated to approximately 95 weight per cent. The concentrated solution is then passed at a temperature above its saturation temperature to a prilling tower where it is sprayed against an upwardly moving volume of cooled air.

The liquid particles of ammonium nitrate falling down the tower are chilled to form granules of ammonium nitrate containing no more than 4 weight per cent moisture. The ammonium nitrate prills fall to the bottom of the tower and are recovered. The prills can then be dried, cooled, screened and coated with an argillaceous material to prevent absorption of moisture.

The improvement is obtained by adding a minute amount of ammonia to the stream of 95 per cent solution being fed to the prilling tower.

Soil Conditioner to Increase Soil Porosity

US 2,741,876 issued April 17, 1956 to Carlo Paoloni, relates to a soil conditioner for increasing the porosity of soil, which is effective in treating acidic clay-containing soils.

It has been found that a con-

glomeration of ferric oxide and ferric sulfate buffers the acidity of the soil and brings about the desired flocculation of the clay-containing soil. About one-half to two tons are applied per acre.

Freeze-Resistant 2, 4, 5-T Herbicides

US 2,741,115 and 2,741,116 issued April 10, 1956 to John R. Warren and to James H. Fookes, respectively, and assigned to Dow Chemical Co., describe 2,4,5-T herbicidal compositions which have marked resistance to freezing at low temperature.

The problem is solved by using mixtures of the n-butyl and isobutyl esters of 2,4,5-T. Thus prepared, the compositions do not freeze above 0° C, and usually do not freeze well below this temperature.

Stengel-Dorsey Patent Assigned Comm. Solv.

US 2,739,037 issued March 20, 1956 to Leonard A. Stengel and John J. Dorsey, Jr., assigned to Commercial Solvents Corp., describes an improvement in the production of dry ammonium nitrate from ammonia and nitric acid solution.

The steam and molten ammonium nitrate coming from the reactor are passed into a steam separator maintained under vacuum at an elevated temperature, the residence time of the molten ammonium nitrate being below five seconds. This permits a reduction of the reaction temperature below what is normally required, thereby avoiding losses in yield due to decomposition of the ammonium nitrate product or the nitric acid reactant.

Esso Assigned Soil Sterilization Patent

US 2,741,550 issued April 10, 1956 to Robert E. Emond and James Arnot and assigned to Esso Research and Engineering Co., describes herbicidal compositions which sterilize the soil against growth of weeds and grasses without creating hazards from fire or soil erosion (e.g., around refinery tanks).

An aqueous solution of borax is followed by application of an aromatic cracked gas oil or a cut-back asphalt oil. Alone, neither one gives soil sterility, but the combination does. It is believed that the oil prevents the leaching away of borax, permitting it to be more effective.

Mfg. Process for Pelleted Superphos.

US 2,739,886, issued March 27, 1956 to Leroy H. Facer and assigned to Glen E. Cooley et al, describes a process for manufacturing pelleted superphosphate.

Phosphate rock and sulfuric acid are mixed in the usual way. After the mixture has set and while it is still moist, warm and chemically active but before it has cured, it is formed into pellets. While still moist, the pellets are coated with a dry absorptive material.

Soil Conditioning, Enriching Comp.

US 2,741,551 issued April 10, 1956 to Gordon A. Daline describes a prepared granular composition which may be readily distributed for both enriching and conditioning soil.

The soil conditioning agent, hydrolyzed polyacrylonitrile, is mixed with soy bean meal and a dry, water-soluble adhesive, such as the natural adhesive commercially obtainable from soy beans or dextrin. ▲

FARM CHEMICALS

Statistics

Super Output Down

May production of superphosphate and other phosphatic fertilizers decreased 8 per cent from the April, 1956 output to 221,903 short tons, and shipments declined 37 per cent from the previous month's volume. At the end of May, stocks on hand were 9 per cent greater than those held on April 30.

Coke-Oven Ammon.

Sulfate, Liquor in '55

In 1955, production of coke-oven by-product ammonium sulfate amounted to 1,962,652,237 pounds, an increase over 1954 output, the Bureau of Mines reports. It was noted that the 1955 figure includes diammonium phosphate and ammonium thiocyanate.

Coke oven ammonia liquor production reached 33,241,715 pounds (NH₃ content) last year, compared with 32,207,066 pounds in 1954.

API Reports 55-56 Potash Figures

North American potash deliveries during the June, 1955-May, 1956 fiscal year by seven leading American potash producers and the importers amounted to 2,220,463 tons K₂O, an increase of less than 3 per cent over 1954-55, American Potash Institute reports.

Potash for agricultural purposes in this country decreased less than 3 per cent to 1,845,943 tons K₂O. Illinois lead in deliveries. Muriate of potash was the principal grade, comprising 93 per cent of total agricultural potash deliveries.

Deliveries of Potash Salts, June 1955-May 1956

Point of Delivery	Muriate— 60% & 50%	Manure Salts	Sulfates	Total
TOTAL U. S.	1,732,080.51	1,238.37	112,623.71	1,845,942.59
(IMPORTS)	(151,553.59)	—	(16,853.20)	(168,406.79)
Canada	82,498.59	—	7,902.98	90,401.57
(Imports)	(35,628.84)	—	(2,011.10)	(37,639.94)
Cuba	12,985.88	—	2,812.62	15,798.50
(Imports)	—	—	—	—
Hawaii	18,799.83	—	2,516.50	21,316.33
Puerto Rico	17,341.64	—	2,656.44	19,998.08
(Imports)	(3,555.31)	—	(1,079.96)	(4,635.27)
TOTAL INSTITUTE TERRITORIES	1,863,706.45	1,238.37	128,512.25	1,993,457.07
Exports	93,783.02	—	9,740.17	103,523.19
GRAND TOTAL	1,957,489.47	1,238.37	138,252.42	2,096,980.26
(IMPORTS)	(190,737.74)	—	(19,944.26)	(210,682.00)

Figures in parentheses represent imports and are included in the totals immediately above them.

Production — May, 1956

Compiled from Government Sources

Chemical	Unit	1956	May 1955	April 1956
Ammonia, synth. anhydrous	s. tons	310,422	296,799	306,172
Ammonia liquor, coal & coke (NH ₃ content)	pounds	3,066,215	3,431,667	2,978,185
(Including diamm. phosphate & ammon. thiocyanate)				
Ammonium nitrate, fert. grade (100% NH ₄ NO ₃)	s. tons	145,804	135,265	*166,683
Ammonium sulfate				
synthetic (technical)	s. tons	95,915	104,138	92,725
coke-oven by-product	pounds	170,600,825	173,705,575	167,968,582
BHC (Hexachlorocyclohexane)	pounds	8,716,974	5,013,168	8,168,008
Gamma content	pounds	1,424,139	977,818	1,328,813
Copper sulfate (Gross)	s. tons	6,868	7,340	6,944
DDT	pounds	13,711,672	10,703,051	10,966,684
2,4-D Acid	pounds	2,627,036	2,881,463	2,530,908
esters and salts	pounds	2,926,783	3,572,790	2,597,757
esters and salts (acid equiv.)	pounds	2,297,382	2,744,981	2,033,169
Lead Arsenic (acid & basic)	s. tons	436	406	646
Phosphoric acid (50% H ₃ PO ₄)	s. tons	320,688	306,851	312,054
Sulfur, Native (Frasch)	l. tons	—	455,508	504,289
Recovered	l. tons	—	35,800	38,200
Sulfuric acid, gross (100% H ₂ SO ₄)	s. tons	1,381,977	1,372,743	1,362,851
Superphosphate (100% APA)	s. tons	221,903	211,171	*241,236
Normal (100% APA)	s. tons	143,325	132,407	*155,340
Enriched (100% APA)	s. tons	206	5,303	978
Concentrated (100% APA)	s. tons	63,805	73,024	67,717
Wet Base (100% APA)	s. tons	493	437	1,515
Other phos. fertilizers	s. tons	14,074	n.a.	*15,686
2,4,5-T Acid	pounds	491,720	377,406	401,895
Urea	pounds	75,891,500	—	69,308,640
Calcium Arsenate	s. tons	—	—	—

* Revised. N.A. not available.

**Specialists in
Magnesia for Agriculture**
EMJEO (80/82% Magnesium Sulphate)
Calcined Brucite (fertilizer grade) 65% MgO

POTNIT
(95% Nitrate of Potash) for
Specia. Mixtures and Soluble Fertilizers
Other Fertilizer Materials

BERKSHIRE

ISCO **Insecticides—
Fungicides**
Mercury Compounds
for Agricultural Use

Dithiocarbamates
Ferric—Zinc

EXPORT—IMPORT

BERKSHIRE CHEMICALS INC

GRAYBAR BUILDING

420 LEXINGTON AVENUE • NEW YORK 17

LExington 2-5959 • "BERKSKEM" New York

55 New Montgomery St. • San Francisco 5, Cal.

Philadelphia • Boston • Cleveland • Chicago

The Owners of TORRANCE SAND & GRAVEL

Thomas H. Block — Charles W. Shepard

... Take pleasure in announcing
the acquisition of the quarry and
mill of ...

PIONEER PYROPHYLLITE PRODUCERS

Now offering to insecticide and
fertilizer manufacturers:

PHYLLITE

(TRADE NAME)

World's greatest diluent and carrier is non-abrasive, uniform
and adheres readily to foliage. It is ground in a Raymond
mill—95% through 325 mesh and has a low pH of 5.1.
Phyllite is packed in 50 lb. valve bags, 20-ton lots, lowest
prices on the west coast, f.o.b. plant.

REDLITE AGGREGATE

(TRADE NAME)

for aerating soil and amendment

Main Offices: 25701 Crenshaw Blvd., Torrance, Calif.

Phone: DAvenport 6-5162

Plant at 833 West G St., Chula Vista, Calif.

Phone: GArlfield 2-2992

(The previous owners are no longer connected
in any way with our organization)

Vitamin B-12 Made From Milorganite

WITH increasing demand throughout the world
for vitamin B-12, the Milwaukee Sewage Com-
mission has announced a new source for the material.
Under arrangements with the Vern E. Alden Co. of
Chicago, raw sewage sludge will be provided by the
commission for extraction at a plant to be located at
Milwaukee.

The Alden Co. will treat raw sludge and produce
a crude material, which in turn will be sold to
Armour Laboratories. Construction of the extraction
plant has started and it is estimated that commercial
production will begin before fall. Operation of the
plant will be such that it will be a continuous one
calling for maximum automatic production.

Total capacity is estimated to be 200 pounds
(pure vitamin B-12 activity) per year. As additional
markets develop, the proportion of Milorganite
treated will be increased until the entire output is
processed by the extraction facility.

Armour Laboratories will further purify the
aqueous concentrate at its Kankakee, Ill., plant to
meet pharmaceutical specifications. Armour, having
worked in close cooperation with the Alden Co., and
with its experience in the manufacture and use of
pharmaceuticals, speeded the purification process.
Greatest potential volume for the pure form of
Vitamin B-12 is in the animal feed supplement
market.

In the 1930's the commission, under arrangement
with the University of Wisconsin, realized the ad-
vantages of the fertilizer when mixed with feeds.
After the war, in 1945, further work was carried out
by Miner Laboratories, which developed the extrac-
tion process. Although patents on the process were
assigned to the commission, it decided that its pur-
pose was to purify the raw sludge it obtained, and
not to enter into the extraction business.

Fertilizer properties of Milorganite are not altered
during the extraction process nor is the production
reduced because of further treatment. The commis-
sion stated that it will continue to guarantee the
same minimum of plant food material as it did
previously. ▲

STEDMAN

FERTILIZER PLANT EQUIPMENT

STEDMAN FOUNDRY & MACHINE COMPANY, INC.
 Subsidiary of United Engineering and Foundry Company
 General Office & Works: AURORA, INDIANA Founded 1834

All Steel Self Contained
Fertilizer Mixing and Bag-
ging Units

Complete Granulating
Plants

Batch Mixers—Dry Batch-
ing—Pan Mixers—Wet
Mixing

Tailings Pulverizers—Swing
Hammer and Cage Type

Dust Weigh Hoppers

Vibrating Screens

Acid Weigh Scales

Belt Conveyors—Stationary
and Shuttle Types

Batching Systems

Bucket Elevators

Hoppers and Chutes

POTASH
SUPERPHOSPHATE
UREA, 45½% & 46% N.
DI-N-CAL—20.5% N.
(Calcium Ammonium
Nitrate)
BAGS—
Paper and Burlap

ALEX. M. McIVER & SON

Brokers

Fertilizer Materials

Industrial Chemicals

P. O. BOX 155 Ph. 3-4828-29
 CHARLESTON, S. C.

"Since 1915 your most efficient channel for sales
 and purchases of Fertilizer Materials"

CHI-ORGANIC
(Chicago Activated Sludge)
HYNITE TANKAGE
CASTOR POMACE
GROUND
COTTON-BUR ASH
(38-40% K₂O Potash)

Alphabetical List of Advertisers

Adelphia Hotel, Philadelphia, Pa.	—
American Agricultural Chemical Co., New York City	—
American Potash & Chemical Corp., Los Angeles, Calif.	—
Armour Fertilizer Works, Atlanta, Ga.	—
Ashcraft-Wilkinson Co., Atlanta, Ga.	Back Cover, 18
Atkins, Kroll & Co., San Francisco, Cal.	—
H. J. Baker & Bro., New York City	—
Baughman Mfg. Co., Jerseyville, Ill.	—
Berkshire Chemicals, Inc., New York City	64
Bradley & Baker, New York City	9
Bradley Pulverizer Co., Allentown, Pa.	16
Burlap Council, New York City	36
Chase Bag Co., Chicago, Ill.	—
Clark Equipmt. Co., Benton Harbor, Mich.	—
Clover Chemical Co., Pittsburgh, Pa.	—
E. D. Coddington Mfg. Co., Milwaukee, Wis.	—
Cole, R. D. Mfg. Co., Newman, Ga.	—
Commercial Solvents Corporation, New York City	8
Crowley Tar Products Co., New York City	—
Davison Chemical Co., division of W. R. Grace & Co., Balti- more, Md.	12
Duval Sulphur & Potash Co., Houston, Tex.	18
Edwards Laboratory, Norwalk, Ohio	—
Escambia Bay Chemical Corp., Pensacola, Fla.	—
Exact Weight Scale Co., Columbus, Ohio	—
Finco, Inc., North Aurora, Ill.	—
Geigy Agricultural Chemicals, New York City	30
Grand River Chem. Div., Deere & Co., Tulsa, Okla.	—
Hammond Bag & Paper Co., Inc., Wellsburg, W. Va.	—
Highway Equipment Co., Cedar Rapids, Ia.	—
Hough, The Frank G. Co., Libertyville, Ill.	27
Hudson Pulp & Paper Corp., New York City	39
Indian Jute Mills Association, New York City	36
Industrial Marking Equipment	61
International Minerals & Chemicals Corp., Chicago, Ill., Spec. Prod., Phosphate Chemicals Div.	6, 7
Phosphate Materials Div.	—
Potash Div.	23

Jackle, Frank R., New York City	60
Joy Manufacturing Co., Pittsburgh, Pa.	4
Keim, Samuel D., Philadelphia, Pa.	61
Kraft Bag Corporation, New York City	1
Link-Belt Co., Chicago, Ill.	25
Lion Oil Company, El Dorado, Ark.	2
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.	—
Alex. M. McIver & Son, Charleston, S. C.	65
Mississippi River Chem. Corp., St. Louis, Mo.	—
Monarch Mfg. Works, Inc., Philadelphia, Pa.	60
Munson Mill Machinery Co., Utica, N. Y.	61
National Lime & Stone Co., Findlay, Ohio	—
National Potash Co., New York City	21
Nitro-Form Agricultural Chemicals, Woonsocket, R. I.	—
Nitrogen Division, Allied Chemical & Dye Corp., New York City	Second Cover
Pennsylvania Salt Mfg. Co. of Wash., Tacoma, Wash.	14
Phelps-Dodge Refining Corp., New York City	20
Phillips Chemical Co., Bartlesville, Okla.	—
Pioneer Pyrophyllite Producer, Torrance, Calif.	64
Potash Co. of America, Washington, D. C.	Third Cover
Poulsen Co., Los Angeles, Calif.	—
Schmutz Mfg. Co., Louisville, Ky.	35
Shell Chemical Corporation, New York, N. Y.	—
Shuey & Company, Inc., Savannah, Ga.	60
Sinclair Chemicals, Inc., New York City	11
Sohio Chemical Co., Lima, Ohio	—
Southwest Potash Co., New York City	26
Spraying Systems Co., Bellwood, Ill.	—
Stedman Foundry and Machine Co., Inc., Aurora, Ind.	65
Stephens-Adamson Mfg. Co., Aurora, Ill.	—
Sturtevant Mill Co., Boston, Mass.	37
Tennessee Corporation, Atlanta, Ga.	24
Texas Gulf Sulphur Co., New York City	38
Tractomotive Corp., Deerfield, Ill.	29
Union Bag & Paper Corp., New York City	17
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.	9
United States Potash Co., New York City	15
Wisc. Alumni Research Foundation, Madison, Wisc.	57
Woodward & Dickerson, Inc., Philadelphia, Pa.	—

editorial

CONTROL of insects with atomic energy, control of insects with systemics, or with hormones—it's dealer's choice these days. There seems to be no end to the various approaches taken today by scientists to find means of winning our battle against insects. The problems are so complex and challenging that it is encouraging to learn of the many methods investigated and employed in overcoming this major conflict.

Articles and reports are constantly passing over our desks revealing new and uncanny methods of devising destruction against pests.

Now the power of atomic energy is being brought to bear on the hundreds of harmful insect species. Authorities strongly feel that the every day occurrence of fly swatting, scratching and constant spraying for pest control will be greatly reduced thanks to the application of atomic research on a burdensome problem. Scientists also feel that the possible elimination of insects by this means will not in any way affect the biotic balance of nature.

Researchers will concentrate on disease spreading vectors such as those carrying yellow fever and malaria. Cattle formerly scourged by the livestock killing screw worm will be free to fully use our grasslands. Included in this campaign will be home and property destroying pests such as termites, carpet beetles and moths. It has been estimated that total damage due to pest destruction amounts to over 500 million dollars annually.

Weapons in the atomic arsenal will be radio isotopes, used for all-purpose tracing, and ultra sensitive nucleonic instruments to study the intricate means by which insects feed and migrate, and their general physiology. Of prime importance in the use and application of atomic energy will be the study of insecticide efficacy.

Not to be outdone in the new world of insect controls are systemics. Workers at the Tennessee Experiment Station report encouraging results with a new chemical product produced by American Cyanamid called thimet, currently being screened as a seed treatment chemical. Applications at four per cent have resulted in substantial increases in seed cotton production. Increases of 294 pounds per acre have been reported from three western Tennessee field trials—certainly indicative of the product's capability.

At recent meetings in Montreal, members attending the 10th International Congress of Entomology heard of a new twist in the control of insects. Workers report that a new and promising hormone, the Juvenile Hormone, had been discovered in the stomach of the adult silk worm.

Classified as a growth controlling chemical, it will stimulate the stages of metamorphosis at such an accelerated rate that the insects will literally grow themselves to death. When and if the hormone

can be synthesized in large economical quantities, man will have an additional weapon in his pest control arsenal.

During this month the American Chemical Society will hold its 130th meeting from September 16-21, at Atlantic City, N. J. It is during meetings of this type that men of vision have an opportunity to discuss problems of mutual interest and express the findings of their work.

Of exceptional importance during the meetings will be the gathering of the pesticide section, where of interest will be a discussion regarding the relationship between the chemical makeup of pesticide compounds in regard to their biotic control. When the key to this problem has been found, man's quest for freedom from insect ravages will have been attained.

FIFTEEN plants of Virginia-Carolina Chemical Corp. recently won safety plaques from the National Safety Council in recognition of their outstanding 1955 records. Of the fifteen winners, twelve were fertilizer plants.

How did VC accomplish such an outstanding record? Listed below are a few suggestions given by the safety committees of the winning plants, which offer some advice on the subject.

After formation of the safety committees, regular meetings were started, and suggestions coming from the group were followed up by plant personnel. They also suggested that to maintain interest and safety at constant levels a contest or some form of competitive program be initiated.

Other factors contributing to good safety and personnel cooperation include placing plant safety records before the employees at all times. This is carried out further by keeping the board both current and attractive.

Supervisory personnel, it was suggested, must realize their role and responsibility in encouraging safe working habits, and in addition, superintendents of its plants conduct regular and planned inspection tours.

At the employee level all minor injuries were reported promptly. New men just starting out for the company were given safety training programs, which are designed to point out the reasons for safety and at the same time create interest in the campaign.

Good safety programs are not achieved by mere mention of the word and a casual program every so often; they are, however, by constant reminding and effort on the part of all employees. With some of the ideas used by VC, additional plants and other industries in the farm chemicals field can achieve the status attained by VC and other leaders in the industry. ▲

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chemical Co., Agr. Chem. Div., N.Y.C.

AMMONIA—Anhydrous and Liquor

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

AMMONIUM NITRATE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM SULFATE

See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE

Atkins, Kroll & Co., San Francisco, Calif.

BAGS—BURLAP

The Burlap Council, New York City
Chase Bag Co., Chicago, Ill.

BAGS—COTTON

Chase Bag Co., Chicago, Ill.

BAGS—Multiwall-Paper

Chase Bag Co., Chicago, Ill.
Kraft Bag Corporation, New York City
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG PRINTING MACHINES

Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES

E. D. Coddington Mfg. Co., Milwaukee, Wisc.
Kraft Bag Corporation, New York City
Stedman Foundry and Machine Co., Aurora, Ind.
Union Bag & Paper Corp., New York City

BHC AND LINDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.

BIN LEVEL CONTROLS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BIN DISCHARGERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BONE PRODUCTS

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID

American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM AMMONIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.
McIver & Son, Alex. M., Charleston, S. C.

CALCIUM ARSENATE

American Agricultural Chemical Co., N. Y. C.

CALCIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.

CAR PULLERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART

Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS

Shuey & Co., Inc., Savannah, Ga.

CHLOROBENZILATE

Geigy Agr. Chems. Div. Geigy Chem. Corp. N.Y.C.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Finlay, Ohio

CONVEYORS

Baughman Mfg. Co., Jerseyville, Ill.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE

Phelps-Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.

DIAZINON

Geigy Agr. Chems. Geigy Chem. Corp., N.Y.C.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

DITHIOCARBAMATES

Berkshire Chemicals, New York City

ELEVATORS

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN

Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

ENGINEERS—Chemical and Industrial

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid

Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—MIXED

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS

Bradley & Baker, N. Y. C.

Fish SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Tennessee Corp., Atlanta, Ga.

HERBICIDES

American Potash & Chemical Corp., Los Angeles, California
Lion Oil Company, El Dorado, Ark.

HERBICIDES—Oils

Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., N. Y. C.
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Shell Chem. Corp., Agr. Chem. Div., Denver Colo.

IRON CHELATES

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

IRON SULFATE

Tennessee Corp., Atlanta, Ga.

LABORATORY SERVICES

Wisc. Alumni Research Foundation, Madison, Wisc.

LEAD ARSENATE

American Agricultural Chemical Co., N.Y.C.

LIMESTONE

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Finlay, Ohio

MACHINERY—Acid Making and Handling

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating

Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling

Clark Equip't. Co., Construction Mach. Div., Beaton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adams Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

MACHINERY—Mixing and Blending

Munson Mill Mach. Co., Utica, N. Y.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY

Superphosphate Manufacturing
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MAGNESIUM SULFATE

Berkshire Chemicals, New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

METHOXYCHLOR

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

MINOR ELEMENTS

Geigy Agr. Chems., Div., Geigy Chem. Corp., N.Y.C.
Tennessee Corporation, Atlanta, Ga.

MIXERS

Munson Mill Mach. Co., Utica, N. Y.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF POTASH

Berkshire Chemicals, New York City

NITRATE OF SODA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Company, El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Sons, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION

Ashcraft-Wilkinson Co., Atlanta, Ga.

PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Exact Weight Scale Co., Columbus, O.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS

Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SHOVEL LOADERS

Clark Equip't. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Tractomotive Corp., Deerfield, Ill.

SOILTEST EQUIPMENT

The Edwards Laboratory, Norwalk, O.

SPRAYERS

Finco, Inc., N. Aurora, Ill.

SPRAYS

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK

Baughman Manufacturing Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE TANKS

Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS

Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM

Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

FARM CHEMICALS



A NEW GIANT SERVANT OF AGRICULTURE

Our NEW STANDARD GRADE MURIATE is winning wide approval and acceptance.

Place your order for early delivery with P.C.A. Your production and operating people will be glad you did.



POTASH COMPANY OF AMERICA CARLSBAD, NEW MEXICO.

General Sales Office . . . 1625 Eye Street, N.W., Washington, D.C.
Midwestern Sales Office . . . First National Bank Bldg., Peoria, Ill.
Southern Sales Office . . . Candler Building, Atlanta, Ga.

FERTILIZER

FOREIGN
AND
DOMESTIC

MATERIALS

NOW AVAILABLE
DUVAL GRANULAR
MURIATE OF POTASH

•
AMNICAL
20.5% Nitrogen
(Ammonium Nitrate Limestone)
•
Samples on request.

★ NITROGEN COMPOUNDS

★ SULPHUR & POTASH

★ ORGANIC AMMONIATES

★ INSECTICIDAL AND INDUSTRIAL
CHEMICALS

EXCLUSIVE DISTRIBUTORS:
DUVAL SULPHUR AND POTASH COMPANY
ESCAMBIA BAY CHEMICAL CORPORATION

**VEGETABLE
OIL MEALS
& FEEDSTUFFS**

ASHCRAFT-WILKINSON CO.

Home Office
ATLANTA, GEORGIA

Cable Address: ASHCRAFT

Tampa, Fla.

Montgomery, Ala.

Norfolk, Va.
Charleston, S. C.

Jackson, Miss.
Columbus, Ohio

STRIA

LE
LS
FES

on, Mid
us, Oh